

Bayer CropScience GmbH

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Im/wa

Description

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Process for preparing acylurea derivatives, salts of these acylurea derivatives and their use as pesticides

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The invention relates to a process for preparing acylurea derivatives, to salts of acylurea derivatives obtainable by this process, to compositions containing them, and to the use thereof as pesticides.

Insecticidal acylurea derivatives are proposed in WO 2003/097604.

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These compounds are prepared by reacting the appropriate carboxamide with oxalyl chloride to give the isocyanate and further reaction thereof with an amine to give the N-acylurea derivative. Formation of the isocyanate is possible only by reacting the amide with oxalyl chloride, but not with phosgene, leading to high process costs.

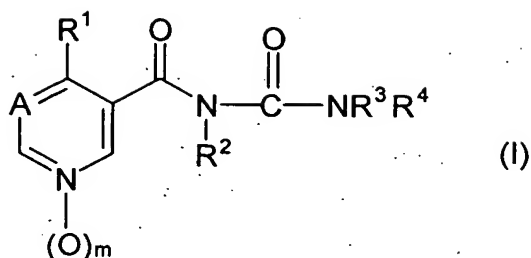
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It was therefore an object to provide a novel advantageous synthesis of acylurea derivatives.

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It has now surprisingly been found that reaction of 4-haloalkylpyri(mi)dine-carboxamides with carbamates or similarly reactive compounds leads in a simple manner to N'-[4-haloalkylpyri(mi)dinyl]carbonylureas in very good yields and high purity.

The invention therefore relates to a process for preparing N-disubstituted-N'-[4-haloalkylpyri(mi)dinyl]carbonylureas of the formula (I),



where

A is CH or N;

5 R^1 is (C₁-C₄)-haloalkyl;

R^2 is H or M;

M is an organic or inorganic cation;

R^3 is (C₁-C₈)-alkyl, (C₃-C₆)-alkenyl, (C₃-C₆)-alkynyl, (C₁-C₈)-alkoxy,

10 (C₃-C₆)-alkenyloxy, (C₃-C₆)-alkynyloxy, (C₃-C₈)-cycloalkyl, (C₃-C₈)-cycloalkyl-(C₁-C₆)-alkyl, O-CH₂-(C₃-C₈)-cycloalkyl, where the last nine groups mentioned are unsubstituted or substituted by one or more R^5 radicals, or is aryl, heterocyclyl, aryloxy, heterocyclyloxy, -CH₂-aryl, -O-CH₂-aryl, -CH₂-heterocyclyl, -O-CH₂-heterocyclyl, where the last eight radicals mentioned are unsubstituted or substituted by one or more R^6 radicals;

15 R^4 is (C₁-C₈)-alkyl, (C₃-C₆)-alkenyl, (C₃-C₆)-alkynyl, (C₃-C₈)-cycloalkyl, (C₃-C₈)-cycloalkyl-(C₁-C₆)-alkyl, where the last five groups mentioned are unsubstituted or substituted by one or more R^5 radicals, or is aryl, heterocyclyl, -CH₂-aryl, -CH₂-heterocyclyl, where the last four groups

20 mentioned are unsubstituted or substituted by one or more R^6 radicals;

or

R^3 and R^4 together with the adjacent N atom form a 3 - 8 membered saturated,

unsaturated or aromatic heterocyclic ring which optionally comprises up to three further heteroatoms from the group of N, S and O and which is unsubstituted or substituted by one or more (C₁-C₆)-alkyl, (C₁-C₆)-haloalkyl or R⁵ radicals;

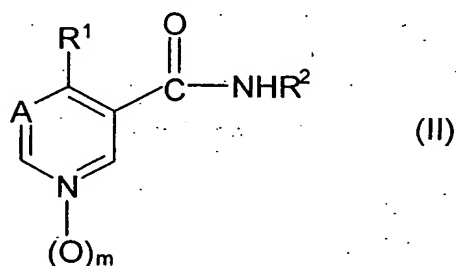
5 R⁵ is halogen, (C₁-C₆)-alkoxy, (C₁-C₆)-haloalkoxy, S(O)_n-(C₁-C₆)-alkyl, S(O)_n-(C₁-C₆)-haloalkyl, CN, COO(C₁-C₆)-alkyl, NO₂, N[(C₁-C₆)-alkyl]₂, phenoxy, unsubstituted or substituted by one or more radicals from the group of (C₁-C₆)-alkyl, (C₁-C₆)-haloalkyl and halogen;

R⁶ is R⁵, (C₁-C₆)-alkyl, (C₁-C₆)-haloalkyl;

10 m is 0 or 1, and

n is 0, 1 or 2,

by reacting a 4-haloalkylpyri(mi)dinylcarboxamide of the formula (II),



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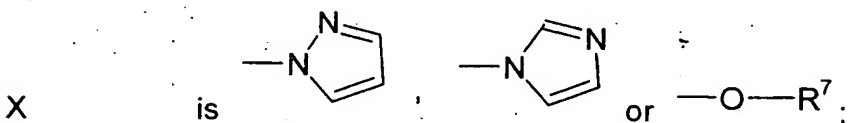
in which A, R¹, R² and m have the meaning indicated for formula (I),

in the presence of a base with a compound of the formula (III),

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in which



R^7 is (C₁-C₈)-alkyl, (C₃-C₆)-alkenyl, (C₃-C₆)-alkynyl, (C₃-C₈)-cycloalkyl, (C₃-C₆)-cycloalkyl-(C₁-C₄)-alkyl, aryl, heterocyclyl, aryl-(C₁-C₄)-alkyl or heterocyclyl-(C₁-C₄)-alkyl, where said groups are unsubstituted or substituted by one or more radicals from the group of halogen, CN and NO₂; and

R^3, R^4 have the meanings indicated for formula (I).

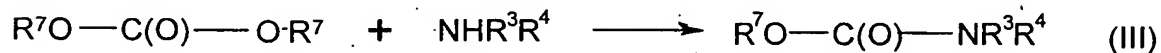
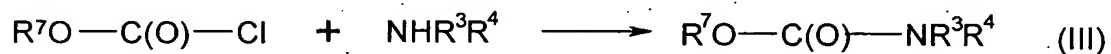
The process of the invention makes it possible to prepare acylurea derivatives in a simple manner under economically and ecologically advantageous conditions.

The starting compounds of the formula (II), 4-haloalkylpyri(mi)dylcarboxamides, are known and are described with their preparation for example in WO-02/48111, German patent application 102 23 274.1 and EP-A-0 580 374.

Compounds of the formula (III) can be prepared by known methods familiar to the skilled worker, by successive reaction of phosgene or other carbonic acid derivatives with a compound HX and with a suitable nitrogen compound, for example a secondary amine or hydroxylamine.

Processes of these types are described for example in Houben-Weyl, Methoden der Organischen Chemie, volume E4.

Carbamates of the formula (III) can be prepared for example from chloroformic esters or carbonates by reaction with suitable nitrogen compounds, for example amines or hydroxylamines.



This process is described for example in Coll. Czech. Chem. Comm. 48, 3, 1983, 900-905 and EP-A 0 577 167.

5 Preferred compounds of the formula (III) are those in which

X is OR⁷ and

R⁷ is unsubstituted or mono- or polyhalo, preferably F and/or Cl,
-substituted (C₁-C₆)-alkyl or (C₃-C₆)-alkenyl, phenyl or benzyl,
10 particularly preferably CH₃, C₂H₅, i-C₃H₇, -CH₂-CH=CH₂, -CH₂-CF₃,
CH₂-CF₂-CF₂H, CCl₃, phenyl or benzyl, in particular -CH₂-CH=CH₂;
AlkOAlk-; CH₃ or C₂H₅.

The molar ratio of amide (II) to compound (III) is generally 1:1 - 1.1, preferably 1:1 -
15 1.05, particularly preferably about 1:1.

Preference is given as base to hydrides, amides, hydroxides and (C₁-C₆)-
alcoholates of the alkali metals and alkaline earth metals, alkyllithium compounds,
metal hydrides, carbonates and acetates of the alkali metals and alkaline earth
20 metals, tertiary amines having C₁-C₄-alkyl radicals and sterically hindered nitrogen
bases. Particular preference is given to Na(OCH₃), K(OCH₃), Na(OC₂H₅),
K(OC₂H₅), Na(O-t-C₄H₉), K(O-t-C₄H₉), Na(O-n-C₅H₁₁), K(O-n-C₅H₁₁),
Na(O-i-C₅H₁₁), K(O-i-C₅H₁₁), NaH, LiN(i-C₃H₇)₂ (LDA), NaOH, KOH, Na₂CO₃,
K₂CO₃, Na acetate, K acetate, triethylamine, 1,5-diazabicyclo[4.3.0]non-5-ene
25 (DBU). Very particular preference is given to Na(OCH₃), KO(CH₃), Na(O-t-C₄H₉)
and NaH, NaOH.

In a preferred variant, the salt formation is carried out under reduced pressure, preferably at a pressure in the range 20-200 mbar, particularly preferably 30-150 mbar, in particular 50-150 mbar. At the same time there is preferably distillation of the low-boiling products out of the reaction mixture, thus making complete amide salt formation possible. The reduced pressure is advantageously chosen so that the boiling point of the eliminated compounds, such as H₂O, CH₃OH, tButOH or EtOH, is below the reaction temperature, and the boiling point of the solvent is above the reaction temperature.

It is also possible to employ mixtures of a plurality of bases. In general, from 1 to 1.1, preferably 1-1.05, equivalents of base are employed, based on 1 equivalent of the amide.

The process is generally carried out in a solvent. Preference is given to polar, aprotic solvents, particularly preferably N,N-dimethylformamide (DMF), N-methylpyrrolidone (NMP), N,N-dimethylacetamide, dimethoxyethane, sulfolane and tetrahydrofuran (THF), very particularly preferably DMF and NMP.

Mixtures of solvents can also be employed.

In general, 1 - 20 equivalents by weight of solvent are used per equivalent of amide.

The reaction temperature is generally between 0 and 100°C, preferably between 30 and 75°C.

In a preferred variant, the reaction is carried out under reduced pressure, preferably at a pressure in the range 20-200 mbar, particularly preferably 30-150 mbar, in particular 50-150 mbar. At the same time there is preferably distillation of the low-boiling products out of the reaction mixture, thus making complete reaction possible.

The reduced pressure is advantageously chosen so that the boiling point of the eliminated compound R₇OH, such as CH₃OH, tButOH, EtOH or CH₂=CH-CH₂OH,

is below the reaction temperature, and the boiling point of the solvent is above the reaction temperature.

The reaction generally takes from 1 to 4 hours.

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Working up takes place by known methods familiar to the skilled worker, for example by filtration or extraction, washing and drying, and where appropriate subsequent chromatographic purification.

- 10 For amides of the formula (II) with $R^2 = H$, the process initially leads to the corresponding salts ($R^2 = M$) which can advantageously be removed from the reaction mixture in particularly high purity by filtration. Further working up can take place by known methods familiar to the skilled worker. For example, the precipitated product is filtered off, washed and dried. Compounds of the formula (I) with $R^2 = H$
- 15 can be liberated from the salts of the formula (I) in a known manner familiar to the skilled worker, for example by reaction with acids such as HCl , H_2SO_4 , CH_3CO_2H and H_3PO_4 .

The terms used in the formulae (I) to (III) are explained in more detail below.

20

The term "halogen" means fluorine, chlorine, bromine and iodine, preferably fluorine and chlorine, particularly preferably fluorine.

"(C₁-C₄)-alkyl" is an unbranched or branched hydrocarbon radical having 1, 2, 3 or 4 carbon atoms, e.g. the methyl, ethyl, propyl, isopropyl, 1-butyl, 2-butyl, isobutyl or

25 tert-butyl radical.

Correspondingly an alkyl radical with a larger range of carbon atoms means an unbranched or branched saturated hydrocarbon radical which contains a number of carbon atoms corresponding to this stated range. The term "(C₁-C₈)-alkyl"

accordingly includes the aforementioned alkyl radicals and, for example, the pentyl, 2-methylbutyl, 1,1-dimethylpropyl, hexyl, heptyl, octyl and tert-octyl radical.

"(C₁-C₄)-haloalkyl" is an alkyl group mentioned for "(C₁-C₄)-alkyl" in which one or more hydrogen atoms are replaced with the same number of identical or different halogen atoms, preferably chlorine or fluorine, e.g. the mono, di- or trifluoromethyl group, the 1- or 2-fluoroethyl, the 2,2,2-trifluoroethyl, the chloromethyl, trichloromethyl or the 1,1,2,2-tetrafluoroethyl group.

"Alkenyl" and "alkynyl" with a prefixed stated range of carbon atoms mean a straight-chain or branched hydrocarbon radical with a number of carbon atoms

corresponding to the stated range and comprising at least one multiple bond, it being possible for the latter to be at any position in the relevant unsaturated radical.

"(C₃-C₆)-alkenyl" accordingly is, for example, the allyl, 2-methylpropenyl, 1- or 2-butenyl, pentenyl, 2-methylpentenyl or hexenyl group.

"(C₃-C₆)-alkynyl" is, for example, the propargyl, 2-methylpropynyl, 2-butylnyl, pentynyl, 2-methylpentynyl or the hexynyl group.

"(C₃-C₁₀)-cycloalkyl" means monocyclic alkyl radicals such as the cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl radical, bicyclic alkyl radicals such as the norbornyl or bicyclo[2.2.2]octyl radical, or fused systems such as the decahydronaphthyl radical.

The term "(C₃-C₆)-cycloalkyl-(C₁-C₄)-alkyl" means for example the cyclopropylmethyl, cyclopentylmethyl, cyclohexylmethyl, cyclohexylethyl and cyclohexylbutyl radical.

"(C₁-C₄)-alkoxy" and "(C₁-C₈)-alkoxy" are ether groups whose hydrocarbon radicals have the meanings indicated by the terms "(C₁-C₄)-alkyl" and "(C₁-C₈)-alkyl".

"(C₃-C₆)-alkenyloxy", "(C₃-C₆)-alkynyloxy", "(C₃-C₆)-cycloalkoxy" and "(C₄-C₁₀)-cycloalkenyloxy" are ether groups whose hydrocarbon radicals have the meanings indicated for the terms "(C₃-C₆)-alkenyl", "(C₃-C₆)-alkynyl", "(C₃-C₈)-cycloalkyl" and "(C₄-C₁₀)-cycloalkenyl".

The term "heterocyclyl" preferably means a cyclic radical which may be completely saturated, partly unsaturated or completely unsaturated or aromatic and which may be interrupted by at least one or more identical or different atoms from the group of nitrogen, sulfur or oxygen, although two oxygen atoms may not be directly adjacent, and at least one carbon atom must still be present in the ring, such as, for example, a radical of thiophene, furan, pyrrole, thiazole, oxazole, imidazole, isothiazole, isoxazole, pyrazole, 1,3,4-oxadiazole, 1,3,4-thiadiazole, 1,3,4-triazole, 1,2,4-oxadiazole, 1,2,4-thiadiazole, 1,2,4-triazole, 1,2,3-triazole, 1,2,3,4-tetrazole, benzo[b]thiophene, benzo[b]furan, indole, benzo[c]thiophene, benzo[c]furan, isoindole, benzoxazole, benzothiazole, benzimidazole, benzisoxazole, benzisothiazole, benzopyrazole, benzothiadiazole, benzotriazole, dibenzofuran, dibenzothiophene, carbazole, pyridine, pyrazine, pyrimidine, pyridazine, 1,3,5-triazine, 1,2,4-triazine, 1,2,4,5-tetrazine, quinoline, isoquinoline, quinoxaline, quinazoline, cinnoline, 1,8-naphthyridine, 1,5-naphthyridine, 1,6-naphthyridine, 1,7-naphthyridine, phthalazine, pyridopyrimidine, purine, pteridine, 4H-quinolizine, piperidine, pyrrolidine, oxazoline, tetrahydrofuran, tetrahydropyran, isoxazolidine or thiazolidine.

Heterocyclyl particularly preferably means a saturated, partially saturated or aromatic ring system having 3 to 6 ring members and 1 to 4 heteroatoms from the group of O, S and N, it being necessary for at least one carbon atom to be present in the ring.

Heterocyclyl very particularly preferably means a radical of pyridine, pyrimidine, (1,2,4)-oxadiazole, (1,3,4)-oxadiazole, pyrrole, furan, thiophene, oxazole, thiazole, imidazole, pyrazole, isoxazole, 1,2,4-triazole, tetrazole, pyrazine, pyridazine, oxazoline, thiazoline, tetrahydrofuran, tetrahydropyran, morpholine, piperidine, piperazine, pyrroline, pyrrolidine, oxazolidine, thiazolidine, oxirane and oxetane.

"Aryl" preferably means an aryl radical having 6 to 12, particularly preferably 6 to 10, carbon atoms, for example the phenyl or naphthyl group, very particularly preferably a phenyl group.

The symbols and indices in formulae (I) to (III) preferably have the following meanings:

A is preferably CH.

5 R^1 is preferably a (C₁-C₄)-alkyl group which is substituted one or more times by F and/or Cl, particularly preferably CF₃, CHF₂ or CF₂Cl, especially CF₃.

R^2 is preferably M or H.

10 M is preferably a non-oxidizable inorganic or organic cation, particularly preferably Li, Na, K, Cs, Ca²⁺/2, N[(C₁-C₄)-alkyl]₄, such as N(CH₃)₄, N(C₂H₅)₄, very particularly preferably Na.

15 R^3 is preferably (C₁-C₈)-alkyl, (C₃-C₆)-alkenyl, (C₃-C₆)-alkynyl, (C₁-C₈)-alkoxy, (C₃-C₆)-alkenyloxy, (C₃-C₆)-alkynyloxy, (C₃-C₈)-cycloalkyl, (C₃-C₈)-cycloalkyl-(C₁-C₆)-alkyl, O-CH₂-(C₃-C₈)-cycloalkyl, where the last nine groups mentioned are unsubstituted or substituted by one or more R^5 radicals, or is aryl, heterocyclyl, aryloxy, heterocyclyloxy, -CH₂-aryl, -O-CH₂-aryl, -CH₂-heterocyclyl, -O-CH₂-heterocyclyl, where the last eight groups mentioned are unsubstituted or substituted by one or more R^6 radicals.

20 R^4 is preferably (C₁-C₈)-alkyl, (C₃-C₆)-alkenyl, (C₃-C₆)-alkynyl, (C₃-C₈)-cycloalkyl, (C₃-C₈)-cycloalkyl-(C₁-C₆)-alkyl, where the last five groups mentioned are unsubstituted or substituted by one or more R^5 radicals, or is aryl, heterocyclyl, -CH₂-aryl, -CH₂-heterocyclyl, where the last four groups mentioned are unsubstituted or substituted by one or more R^6 radicals.

25

R^5 is preferably halogen, in particular F, Cl, (C₁-C₆)-alkoxy, (C₁-C₆)-haloalkoxy.

R^6 is preferably R^5 , (C₁-C₆)-alkyl, (C₁-C₆)-haloalkyl.

R^7 is preferably unsubstituted or mono- or polyhalo, preferably F and/or Cl,

5 -substituted (C₁-C₆)-alkyl or (C₃-C₆)-alkenyl, phenyl or benzyl, particularly preferably CH₃, C₂H₅, i-C₃H₇, -CH₂-CH=CH₂, -CH₂-CF₃, CH₂-CF₂-CF₂H, CCl₃, phenyl or benzyl, in particular CH₃ or C₂H₅.

X is preferably -O- R^7 .

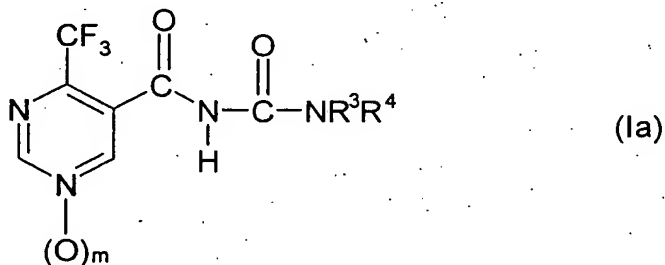
m is preferably 0.

10 n is preferably 0, 1 or 2.

Preferred compounds of the formula (I) to (III) are those in which all the symbols and indices have the preferred meanings.

15 The compounds of the formula (I) are in some cases known and in some cases novel.

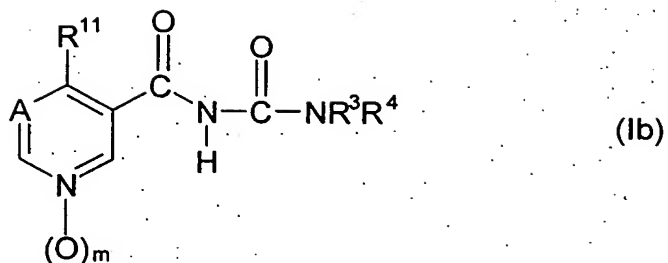
The invention therefore also relates to the compounds of the formula (I)', i.e. of the formulae (Ia), (Ib) and (Ic),



20 where

R^3 , R^4 and m have the meaning indicated for formula (I).

25 The invention likewise relates to compounds of the formula (Ib),

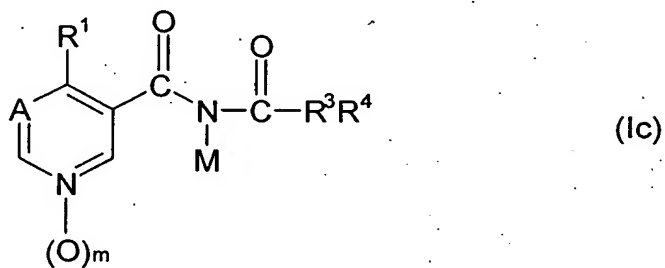


where

R^{11} is (C₁-C₄)-haloalkyl with the exception of CF₃, preferably CHF₂ or CF₂Cl; and

A, R³, R⁴, m have the meanings indicated for formula (I).

The invention further relates to compounds of the formula (Ic),



in which

M is an organic or inorganic cation, preferably Li, Na, K, Cs, 1/2 Ca, N[(C₁-C₄)-alkyl]₄, such as N(CH₃)₄ or N(C₂H₅)₄, very particularly preferably Na, K and Li; and

A, R¹, R³, R⁴ and m have the meanings indicated for formula (I).

Preferred compounds of the formulae (Ia) - (Ic) are those in which the symbols and indices have the meanings indicated as preferred for formula (I).

"Insecticide" means hereinafter, unless otherwise evident from the context, an activity against harmful arthropods such as insects and arachnids, and helminths such as nematodes.

- 5 The compounds of the formula (I)' are suitable for controlling animal pests, in particular insects, arachnids and helminths, preferably for controlling insects and arachnids which are encountered in agriculture, in livestock breeding, in forests, in the protection of stored goods and materials, and in the hygiene sector, and have good plant tolerance and favorable toxicity to warm-blooded species. They are
10 active against normally sensitive and resistant species and against all or individual developmental stages. The abovementioned pests include:

From the order of the Acarina, for example, *Acarus siro*, *Argas* spp., *Ornithodoros* spp., *Dermanyssus gallinae*, *Eriophyes ribis*, *Phyllocoptruta oleivora*, *Boophilus* spp.,
15 *Rhipicephalus* spp., *Amblyomma* spp., *Hyalomma* spp., *Ixodes* spp., *Psoroptes* spp., *Chorioptes* spp., *Sarcoptes* spp., *Tarsonemus* spp., *Bryobia praetiosa*, *Panonychus* spp., *Tetranychus* spp., *Eotetranychus* spp., *Oligonychus* spp., *Eutetranychus* spp..

From the order of the Isopoda, for example, *Oniscus aselus*, *Armadium vulgare*, *Porcellio scaber*.

- 20 From the order of the Diplopoda, for example, *Blaniulus guttulatus*.

From the order of the Chilopoda, for example, *Geophilus carpophagus*, *Scutigera* spp..

From the order of the Symphyla, for example, *Scutigera immaculata*.

From the order of the Thysanura, for example, *Lepisma saccharina*.

- 25 From the order of the Collembola, for example, *Onychiurus armatus*.

From the order of the Orthoptera, for example, *Blatta orientalis*, *Periplaneta americana*, *Leucophaea maderae*, *Blattella germanica*, *Acheta domesticus*, *Gryllotalpa* spp., *Locusta migratoria migratorioides*, *Melanoplus differentialis*, *Schistocerca gregaria*.

- 30 From the order of the Isoptera, for example, *Reticulitermes* spp..

From the order of the Anoplura, for example, *Phylloera vastatrix*, *Pemphigus* spp., *Pediculus humanus corporis*, *Haematopinus* spp., *Linognathus* spp..

From the order of the Mallophaga, for example, *Trichodectes* pp., *Damaline*a spp..
From the order of the Thysanoptera, for example, *Hercinothrips femoralis*, *Thrips tabaci*.

From the order of the Heteroptera, for example, *Eurygaster* spp., *Dysdercus*
5 *intermedius*, *Piesma quadrata*, *Cimex lectularius*, *Rhodnius prolixus*, *Triatoma* spp..

From the order of the Homoptera, for example, *Aleurodes brassicae*, *Bemisia tabaci*,
Trialeurodes vaporariorum, *Aphis gossypii*, *Brevicoryne brassicae*, *Cryptomyzus*
ribis, *Doralis fabae*, *Doralis pomi*, *Eriosoma lanigerum*, *Hyalopterus arundinis*,
Macrosiphum avenae, *Myzus* spp., *Phorodon humuli*, *Rhopalosiphum padi*,

10 *Empoasca* spp., *Euscelus bilobatus*, *Nephotettix cincticeps*, *Lecanium corni*,
Saissetia oleae, *Laodelphax striatellus*, *Nilaparvata lugens*, *Aonidiella aurantii*,
Aspidiotus hederae, *Pseudococcus* spp., *Psylla* spp..

From the order of the Lepidoptera, for example, *Pectinophora gossypiella*, *Bupalus*
piniarius, *Cheimatobia brumata*, *Lithocolletis blancardella*, *Hyponomeuta padella*,

15 *Plutella maculipennis*, *Malacosoma neustria*, *Euproctis chrysorrhoea*, *Lymantria*
spp., *Bucculatrix thurberiella*, *Phyllocnistis citrella*, *Agrotis* spp., *Euxoa* spp., *Feltia*
spp., *Earias insulana*, *Heliothis* spp., *Laphygma exigua*, *Mamestra brassicae*,
Panolis flammea, *Prodenia litura*, *Spodoptera* spp., *Trichoplusia ni*, *Carpocapsa*
pomonella, *Pieris* spp., *Chilo* spp., *Pyrausta nubilalis*, *Ephestia kuehniella*, *Galleria*
20 *mellonella*, *Cacoecia podana*, *Capua reticulana*, *Choristoneura fumiferana*, *Clysia*
ambiguella, *Homona magnanima*, *Tortrix viridana*.

From the order of the Coleoptera, for example, *Anobium punctatum*, *Rhizophor*tha
dominica, *Bruchidius obtectus*, *Acanthoscelides obtectus*, *Hylotrupes bajulus*,

Agelastica alni, *Leptinotarsa decemlineata*, *Phaedon cochleariae*, *Diabrotica* spp.,
25 *Psylloides chrysocephala*, *Epilachna varivestis*, *Atomaria* spp., *Oryzaephilus*
surinamensis, *Anthonomus* spp., *Sitophilus* spp., *Otiorrhynchus sulcatus*,
Cosmopolites sordidus, *Ceuthorrynchus assimilis*, *Hypera postica*, *Dermestes* spp.,
Trogoderma, *Anthrenus* spp., *Attagenus* spp., *Lyctus* spp., *Meligethes aeneus*,
Ptinus spp., *Niptus hololeucus*, *Gibbium psyllodes*, *Tribolium* spp., *Tenebrio molitor*,
30 *Agriotes* spp., *Conoderus* spp., *Melolontha melolontha*, *Amphimallon solstitialis*,
Costelytra zealandica.

From the order of the Hymenoptera, for example, *Diprion* spp., *Hoplocampa* spp., *Lasius* spp., *Monomorium pharaonis*, *Vespa* spp..

From the order of the Diptera, for example, *Aedes* spp., *Anopheles* spp., *Culex* spp., *Drosophila melanogaster*, *Musca* spp., *Fannia* spp., *Calliphora erythrocephala*,
 5 *Lucilia* spp., *Chrysomyia* spp., *Cuterebra* spp., *Gastrophilus* spp., *Hypobosca* spp., *Stomoxys* spp., *Oestrus* spp., *Hypoderma* spp., *Tabanus* spp., *Tannia* spp., *Bibio hortulanus*, *Oscinella frit*, *Phorbia* spp., *Pegomyia hyoscyami*, *Ceratitis capitata*, *Dacus oleae*, *Tipula paludosa*.

From the order of the Siphonaptera, for example, *Xenopsylla cheopsis*,

10 *Ceratophyllus* spp..

From the order of the Arachnida, for example, *Scorpio maurus*, *Latrodectus mactans*.

From the class of the helminths, for example, *Haemonchus*, *Trichostrongylus*, *Ostertagia*, *Cooperia*, *Chabertia*, *Strongyloides*, *Oesophagostomum*, *Hyostrongylus*,

15 *Ancylostoma*, *Ascaris* and *Heterakis* and also *Fasciola*.

From the class of the Gastropoda, for example, *Deroceras* spp., *Arion* spp., *Lymnaea* spp., *Galba* spp., *Succinea* spp., *Biomphalaria* spp., *Bulinus* spp., *Oncomelania* spp..

From the class of the Bivalva, for example, *Dreissena* spp..

20 It is furthermore possible to control Protozoa, such as *Eimeria*.

The plant-parasitic nematodes which can be controlled in accordance with the invention include, for example, the root-parasitic soil-dwelling nematodes such as,

for example, those of the genera *Meloidogyne* (root knot nematodes, such as

25 *Meloidogyne incognita*, *Meloidogyne hapla* and *Meloidogyne javanica*), *Heterodera* and *Globodera* (cyst-forming nematodes, such as *Globodera rostochiensis*,

Globodera pallida, *Heterodera trifolii*) and of the genera *Radopholus*, such as *Radopholus similis*, *Pratylenchus* such as *Pratylenchus neglectus*, *Pratylenchus penetrans* and *Pratylenchus curvatus*; *Tylenchulus* such as *Tylenchulus*

30 *semipenetrans*, *Tylenchorhynchus*, such as *Tylenchorhynchus dubius* and

Tylenchorhynchus claytoni, *Rotylenchus* such as *Rotylenchus robustus*,

Heliocotylenchus such as *Heliocotylenchus multicinctus*, *Belonoaimus* such as

Belonoaimus longicaudatus, Longidorus such as Longidorus elongatus, Trichodorus such as Trichodorus primitivus and Xiphinema such as Xiphinema index.

Nematode genera which can furthermore be controlled using the compounds according to the invention are Ditylenchus (stem parasites, such as Ditylenchus dipsaci and Ditylenchus destructor), Aphelenchoides (foliar nematodes, such as Aphelenchoides ritzemabosi) and Anguina (flower and leaf-gall nematodes, such as Anguina tritici).

The compounds according to the invention are preferably suitable for controlling sucking insects, such as aphids (for example Aphis fabae, Aphis pomi, Aphis spiraecola, Aphis gossypii, Aphis nasturtii, Dysaphis plantaginea, Eriosoma spp., Rhopalosiphum padi, Acyrthosiphon pisum, Pemphigus bursarius, Myzus persicae, Myzus nicotianae, Myzus euphorbiae, Phylloxera spp., Toxoptera spp, Brevicoryne brassicae, Macrosiphum avenae, Macrosiphum euphorbiae, Nasonovia ribisnigri, Sitobion avenae, Brachycaudus helychrysi or Phorodon humuli), cicadas (Idioscopus clypealis, Scaphoides titanus, Empoasca onuki, Empoasca vitis, Empoasca devastans, Empoasca libyca, Empoasca biguttula, Empoasca facialis, or Erythroneura spp), Thrips (Hercinothrips femoralis, Scirtothrips aurantii, Scirtothrips dorsalis, Frankliniella schultzei, Frankliniella fusca, Frankliniella occidentalis, Frankliniella tritici, Kakothrips spp., Thrips oryzae, Thrips palmi, Thrips tabaci) or white flies (Aleurodes brassicae, Bemisia tabaci, Trialeurodes vaporariorum, Aleurodes proletella) and mealybugs (Dysmicoccus spp., Planococcus spp., Phenacoccus spp.).

The invention also relates to compositions, for example pesticides, preferably insecticidal, acaricidal, and nematicidal, especially preferably insecticidal and acaricidal, compositions which comprise one or more compounds of the formula (I) in addition to suitable formulation auxiliaries.

To prepare the compositions according to the invention, the active compound and the other additives are combined and brought into a suitable use form.

In general, the compositions according to the invention comprise 1 to 95% by weight of the active compounds of the formula (I). They can be formulated in various ways, depending on the biological and/or chemical-physical parameters which prevail. The following are examples of possible formulations:

- 5 Wettable powders (WP), emulsifiable concentrates (EC), aqueous solutions (SL), emulsions, sprayable solutions, oil- or water-based dispersions (SC), suspo-emulsions (SE), dusts (DP), seed-dressing products, granules in the form of microgranules, spray granules, coated granules and adsorption granules, water-dispersible granules (WG), ULV formulations, microcapsules, waxes or baits.

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These individual types of formulations are known in principle and are described, for example, in: Winnacker-Küchler, "Chemische Technologie" [Chemical Technology], Volume 7, C. Hanser Verlag Munich, 4th Edition 1986; van Falkenberg, "Pesticides Formulations", Marcel Dekker N.Y., 2nd Ed. 1972-73; K. Martens, "Spray Drying Handbook", 3rd Ed. 1979, G. Goodwin Ltd. London.

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The necessary formulation auxiliaries, i.e. carrier materials and/or surface-active compounds such as inert materials, surfactants, solvents and other additives, are also known and described, for example, in: Watkins, "Handbook of Insecticide Dust Diluents and Carriers", 2nd Ed., Darland Books, Caldwell N.J.; H. v. Olphen, "Introduction to Clay Colloid Chemistry", 2nd Ed., J. Wiley & Sons, N.Y.; Marsden, "Solvents Guide", 2nd Ed., Interscience, N.Y. 1950; McCutcheon's, "Detergents and Emulsifiers Annual", MC Publ. Corp., Ridgewood N.J.; Sisley and Wood, "Encyclopedia of Surface Active Agents", Chem. Publ. Co. Inc., N.Y. 1964; Schönfeldt, "Grenzflächenaktive Äthylenoxidaddukte" [Surface-active ethylene oxide adducts],

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Wiss. Verlagsgesell., Stuttgart 1967; Winnacker-Küchler, "Chemische Technologie", Volume 7, C. Hanser Verlag Munich, 4th Edition 1986.

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Based on these formulations, it is also possible to prepare combinations with other pesticidally active materials, fertilizers and/or growth regulators, for example in the form of a ready-mix formulation or a tank mix. Wettable powders are preparations which are uniformly dispersible in water which, besides the active compound, also

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comprise wetters, for example polyoxyethylated alkylphenols, polyoxyethylated fatty alcohols, alkylsulfonates or alkylphenolsulfonates and dispersants; for example sodium lignosulfonate or sodium 2,2'-dinaphthylmethane-6,6'-disulfonate, in addition to a diluent or inert material.

5

Emulsifiable concentrates are prepared by dissolving the active compound in an organic solvent, for example butanol, cyclohexanone, dimethylformamide, xylene or else higher-boiling aromatics or hydrocarbons, with addition of one or more emulsifiers. As emulsifiers, the following can be used, for example: calcium alkylaryl-sulfonates such as calcium dodecylbenzenesulfonate, or nonionic emulsifiers such as fatty acid polyglycol esters, alkylaryl polyglycol ethers, fatty alcohol polyglycol ethers, propylene oxide/ethylene oxide condensates, alkyl polyethers, sorbitan fatty acid esters, polyoxyethylene sorbitan fatty acid esters or polyoxyethylene sorbitol esters.

15

Dusts are obtained by grinding the active compound with finely divided solid materials, for example talc or natural clays, such as kaolin, bentonite, pyrophyllite or diatomaceous earth. Granules can be prepared either by atomizing the active compound onto adsorptive, granulated inert material or by applying active compound concentrates onto the surface of carrier materials such as sand or kaolinites, or of granulated inert material, by means of adhesives, for example polyvinyl alcohol or sodium polyacrylate, or else mineral oils. Suitable active compounds can also be granulated in the manner which is customary for the preparation of fertilizer granules, if desired as a mixture with fertilizers.

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The active compound concentration in wettable powders is usually approximately 10 to 90% by weight, the remainder to 100% by weight is composed of customary formulation constituents. In the case of emulsifiable concentrates, the active compound concentration may be approximately 5 to 80% by weight. Formulations in the form of dusts usually comprise 5 to 20% by weight of active compound, sprayable solutions approximately 2 to 20% by weight. In the case of granules, the

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active compound content depends partly on whether the active compound is in liquid or solid form and on which granulation auxiliaries, fillers and the like are being used.

Besides this, the abovementioned active compound formulations comprise, if appropriate, the tackifiers, wetters, dispersants, emulsifiers, penetrants, solvents, fillers or carriers which are conventional in each case.

For use, the concentrates, which are present in commercially available form, are, if desired, diluted in the customary manner, for example in the case of wettable powders, emulsifiable concentrates, dispersions and in some cases also micro-granules, using water. Preparations in the form of dusts and granules and sprayable solutions are usually not diluted any further with other inert substances prior to use.

The application rate required varies with the external conditions such as, inter alia, temperature and humidity. It may vary within wide limits, for example between 0.0005 and 10.0 kg/ha or more of active compound, but it is preferably between 0.001 and 5 kg/ha of active compound.

The active compounds according to the invention, in their commercially available formulations and in the use forms prepared from these formulations, may be present in mixtures with other active compounds such as insecticides, attractants, sterilants, acaricides, nematocides, fungicides, growth regulatory substances herbicides or safeners.

Preferred components in mixtures are, for example:

Fungicides:

2-phenylphenol; 8-hydroxyquinoline sulfate; acibenzolar-S-methyl; aldimorph; amido-flumet; ampropylfos; ampropylfos-potassium; andoprim; anilazine; azaconazole; azoxystrobin; benalaxyl; benodanil; benomyl; benthiavalicarb-isopropyl; benzamacril; benzamacril-isobutyl; bilanafos; binapacryl; biphenyl; bitertanol; blasticidin-S;

bromuconazole; bupirimate; buthiobate; butylamine; calcium polysulfide; capsimycin;
 captafol; captan; carbendazim; carboxin; carpropamid; carvone; chinomethionat;
 chlobenthiazone; chlorfenazole; chloroneb; chlorothalonil; chlozolate; clozylacon;
 cyazofamid; cyflufenamid; cymoxanil; cyproconazole; cyprodinil; cyprofuram; dagger
 5 G; debacarb; dichlofluanid; dichlone; dichlorophen; diclocymet; diclomezine;
 dicloran; diethofencarb; difenoconazole; diflumetorim; dimethirimol; dimethomorph;
 dimoxystrobin; diniconazole; diniconazole-M; dinocap; diphenylamine; dipyrithione;
 ditalimfos; dithianon; dodine; drazoxolon; edifenphos; epoxiconazole; ethaboxam;
 ethirimol; etridiazole; famoxadone; fenamidone; fenapanil; fenarimol; fenbuconazole;
 10 fenfuram; fenhexamid; fenitropan; fenoxanil; fencpiclonil; fenpropidin; fenpropimorph;
 ferbam; fluazinam; flubenzimine; fludioxonil; flumetover; flumorph; fluoromide;
 fluoxastrobin; fluquinconazole; flurprimidol; flusilazole; flusulfamide; flutolanil;
 flutriafol; folpet; fosetyl-al; fosetyl-sodium; fuberidazole; furalaxyl; furametpyr;
 furcarbanil; furmecyclox; guazatine; hexachlorobenzene; hexaconazole; hymexazol;
 15 imazalil; imibenconazole; iminoctadine triacetate; iminoctadine tris(albesil; iodocarb;
 ipconazole; iprobenfos; iprodione; iprovalicarb; irumamycin; isoprothiolane;
 isovaledione; kasugamycin; kresoxim-methyl; mancozeb; maneb; meferimzone;
 mepanipyrim; mepronil; metalaxyl; metalaxyl-M; metconazole; methasulfocarb;
 methfuroxam; metiram; metominostrobin; metsulfovax; mildiomicin; myclobutanil;
 20 myclozolin; natamycin; nicobifen; nitrothal-isopropyl; noviflumuron; nuarimol;
 ofurace; orysastrobin; oxadixyl; oxolinic acid; oxpoconazole; oxycarboxin;
 oxyfenthiin; paclobutrazol; pefurazoate; penconazole; pencycuron; phosdiphen;
 phthalide; picoxystrobin; piperalin; polyoxins; polyoxorim; probenazole; prochloraz;
 procymidone; propamocarb; propanosine-sodium; propiconazole; propineb;
 25 proquinazid; prothioconazole; pyraclostrobin; pyrazophos; pyrifenox; pyrimethanil;
 pyroquilon; pyroxyfur; pyrrolnitrine; quinconazole; quinoxifen; quintozone;
 simeconazole; spiroxamine; sulfur; tebuconazole; tecloftalam; tecnazene;
 tetcyclacis; tetraconazole; thiabendazole; thicyofen; thifluzamide; thiophanate-
 methyl; thiram; tioxyamid; tolclofos-methyl; tolylfluanid; triadimefon; triadimenol;
 30 triazbutil; triazoxide; tricyclamide; tricyclazole; tridemorph; trifloxystrobin; triflumizole;
 triforine; triticonazole; uniconazole; validamycin A; vinclozolin; zineb; ziram;
 zoxamide; (2S)-N-[2-[4-[[3-(4-chlorophenyl)-2-propynyl]oxy]-3-methoxyphenyl]ethyl]-

3-methyl-2-[(methylsulfonyl)amino]-butanamide; 1-(1-naphthalenyl)-1H-pyrrole-2,5-dione; 2,3,5,6-tetrachloro-4-(methylsulfonyl)-pyridine; 2-amino-4-methyl-N-phenyl-5-thiazolecarboxamide; 2-chloro-N-(2,3-dihydro-1,1,3-trimethyl-1H-inden-4-yl)-3-pyridinecarboxamide; 3,4,5-trichloro-2,6-pyridinedicarbonitrile; actinovate; cis-1-(4-chlorophenyl)-2-(1H-1,2,4-triazole-1-yl)-cycloheptanol; methyl 1-(2,3-dihydro-2,2-dimethyl-1H-inden-1-yl)-1H-imidazole-5-carboxylate; monopotassium carbonate; N-(6-methoxy-3-pyridinyl)-cyclopropanecarboxamide; N-butyl-8-(1,1-dimethylethyl)-1-oxaspiro[4.5]decan-3-amine; sodium tetrathiocarbonate;

10 and copper salts and preparations such as Bordeaux mixture; copper hydroxide; copper naphthenate; copper oxychloride; copper sulfate; cufraneb; cuprous oxide; mancopper; oxine-copper.

Bactericides:

15 bronopol, dichlorophen, nitrapyrin, nickel dimethyldithiocarbamate, kasugamycin, octhilinone, furancarboxylic acid, oxytetracycline, probenazole, streptomycin, tecloftalam, copper sulfate and other copper preparations.

20 Insecticides/acaricides/nematicides:

abamectin, ABG-9008, acephate, acequinocyl, acetamiprid, acetoprole, acrinathrin, AKD-1022, AKD-3059, AKD-3088, alanycarb, aldicarb, aldoxycarb, allethrin, alpha-cypermethrin (alphamethrin), amidoflumet, aminocarb, amitraz, avermectin, AZ-
25 60541, azadirachtin, azamethiphos, azinphos-methyl, azinphos-ethyl, azocyclotin,

Bacillus popilliae, Bacillus sphaericus, Bacillus subtilis, Bacillus thuringiensis, Bacillus thuringiensis strain EG-2348, Bacillus thuringiensis strain GC-91, Bacillus thuringiensis strain NCTC-11821, baculoviruses, Beauveria bassiana, Beauveria
30 tenella, benclothiaz, bendiocarb, benfuracarb, bensultap, benzoximate, beta-cyfluthrin, beta-cypermethrin, bifenazate, bifenthrin, binapacryl, bioallethrin, bioallethrin-S-cyclopentyl-isomer, bioethanomethrin, biopermethrin, bioresmethrin, bistrifluron,

BPMC, brofenprox, bromophos-ethyl, bromopropylate, bromfenvinfos (-methyl), BTG-504, BTG-505, bufencarb, buprofezin, butathiofos, butocarboxim, butoxycarb-oxim, butylpyridaben,

- 5 cadusafos, camphechlor, carbaryl, carbofuran, carbophenothion, carbosulfan, cartap, CGA-50439, chinomethionat, chlordane, chlordimeform, chloethocarb, chlor-ethoxyfos, chlorfenapyr, chlorfenvinphos, chlorfluazuron, chlormephos, chloro-benzilate, chloropicrin, chlorproxyfen, chlorpyrifos-methyl, chlorpyrifos (-ethyl), chlo-vaporthrin, chromafenozide, cis-cypermethrin, cis-resmethrin, cis-permethrin, clo-
10 cythrin, cloethocarb, clofentezine, clothianidin, clothiazoben, codlemone, couma-phos, cyanofenphos, cyanophos, cycloprene, cycloprothrin, cyfluthrin, cyhalothrin, cyhexatin, cypermethrin, cyphenothrin (1R-trans isomer), cyromazine,

- DDT, deltamethrin, demeton-S-methyl, demeton-S-methylsulphon, diafenthiuron, di-
15 alifos, diazinon, dichlofenthion, dichlorvos, dicofol, dicrotophos, dicyclanil, diflubenz-uron, dimefluthrin, dimethoate, dimethylvinphos, dinobuton, dinocap, dinotefuran, diofenolan, disulfoton, docusat-sodium, dofenapyn, DOWCO-439,

- eflusilanate, emamectin, emamectin benzoate, empenthrin (1R isomer), endosulfan,
20 entomophthora spp., EPN, esfenvalerate, ethiofencarb, ethiprole, ethion, ethoprophos, etofenprox, etoxazole, etrimfos,

- famphur, fenamiphos, fenazaquin, fenbutatin oxide, fenfluthrin, fenitrothion, fenobu-carb, fenothiocab, fenoxacrim, fenoxycarb, fenpropathrin, fenpyrad, fenpyrithrin,
25 fenpyroximate, fensulfothion, fenthion, fentrifanil, fenvalerate, fipronil, flonicamid, flu-acrypyrim, fluazuron, flubenzimine, flubrocycythrinate, flucycloxuron, flucythrinate, flu-fenerim, flufenoxuron, flufenprox, flumethrin, flupyrazofos, flutenzin (flufenzine), flu-valinate, fonofos, formetanate, formothion, fosmethilan, fosthiazate, fubfenprox (flu-proxyfen), furathiocarb,

gamma-cyhalothrin, gamma-HCH, gossyplure, grandlure, granulosis viruses, halfenprox, halofenozide, HCH, HCN-801, heptenophos, hexaflumuron, hexythiazox, hydramethylnone, hydroprene,

- 5 IKA-2002, imidacloprid, imiprothrin, indoxacarb, iodofenphos, iprobenfos, isazofos, isofenphos, isoprocarb, isoxathion, ivermectin,

japonilure,

- 10 kadethrin, kernpolyederviren, kinoprene,

lambda-cyhalothrin, lindane, lufenuron,

malathion, mecarbam, mesulfenfos, metaldehyd, metam-sodium, methacrifos,

- 15 methamidophos, Metarhizium anisopliae, Metarhizium flavoviride, methidathion, methiocarb, methomyl, methoprene, methoxychlor, methoxyfenozide, metofluthrin, metolcarb, metoxadiazone, mevinphos, milbemectin, milbemycin, MKI-245, MON-45700, monocrotophos, moxidectin, MTI-800,

- 20 naled, NC-104, NC-170, NC-184, NC-194, NC-196, niclosamide, nicotine, nitenpyram, nithiazine, NNI-0001, NNI-0101, NNI-0250, NNI-9768, novaluron, noviflururon,

OK-5101, OK-5201, OK-9601, OK-9602, OK-9701, OK-9802, omethoate, oxamyl,

- 25 oxydemeton-methyl,

Paecilomyces fumosoroseus, parathion-methyl, parathion (-ethyl), permethrin (cis-trans-), petroleum, PH-6045, phenothrin (1R-trans isomer), phenthoate, phorate, phosalone, phosmet, phosphamidon, phosphocarb, phoxim, piperonyl butoxide, 30 pirimicarb, pirimiphos-methyl, pirimiphos-ethyl, potassium oleate, prallethrin, profenofos, profluthrin, promecarb, propaphos, propargite, propetamphos, propoxur, prothiofos, prothoate, protrifenbute, pymetrozine, pyraclofos, pyresmethrin,

pyrethrum, pyridaben, pyridalyl, pyridaphenthion, pyridathion, pyrimidifen, pyri-proxyfen,

quinalphos,

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resmethrin, RH-5849, ribavirin, RU-12457, RU-15525,

S-421, S-1833, salithion, sebufos, SI-0009, silafluofen, spinosad, spirodiclofen, spiromesifen, sulfluramid, sulfotep, sulprofos, SZI-121,

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tau-fluvalinate, tebufenozide, tebufenpyrad, tebupirimfos, teflubenzuron, tefluthrin, temephos, temvinphos, terbam, terbufos, tetrachlorvinphos, tetradifon, tetramethrin, tetramethrin (1R isomer), tetrasul, theta-cypermethrin, thiacloprid, thiamethoxam, thiapronil, thiatriphos, thiocyclam hydrogen oxalate, thiodicarb, thiofanox, thiometon, thiosultap-sodium, thuringiensin, tolfenpyrad, tralocythrin, tralomethrin, transfluthrin, triarathene, triazamate, triazophos, triazuron, trichlophenidine, trichlorfon, Trichoderma atroviride, triflumuron, trimethacarb,

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vamidothion, vanilprole, verbutin, Verticillium lecanii,

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WL-108477, WL-40027,

YI-5201, YI-5301, YI-5302,

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XMC, xylylcarb,

ZA-3274, zeta-cypermethrin, zolaprofos, ZXI-8901,

the compound 3-methylphenyl propylcarbamate (Tsumacide Z),

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the compound 3-(5-chloro-3-pyridinyl)-8-(2,2,2-trifluoroethyl)-8-azabicyclo[3.2.1]-octane-3-carbonitrile (CAS Reg. No. 185982-80-3) and the corresponding 3-endo

isomer (CAS Reg. No. 185984-60-5) (cf. WO-96/37494, WO-98/25923),

and preparations which comprise plant extracts, nematodes, fungi or viruses having insecticidal activity.

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The abovementioned components for combinations are known active compounds, many of which are described in C.D.S. Tomlin (Ed.), The Pesticide Manual, 12th Edition, British Crop Protection Council, Farnham 2000.

10 The active compound content of the use forms prepared from the commercially available formulations may range from 0.00000001 up to 95% by weight of active compound, preferably between 0.00001 and 1% by weight.

Application is effected in a customary manner adapted to suit the use forms.

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Accordingly, the invention also provides the use of compounds of the formula (I)' and salts thereof for controlling animal pests, preferably harmful arthropods, such as insects and arachnids and helminths such as nematodes.

20 The invention furthermore provides a method for controlling harmful insects, arachnids and/or helminths which comprises applying an effective amount of a compound of the formula (I)' or a salt thereof onto the pests or the site of the desired action.

25 The active compounds according to the invention are also suitable for controlling endoparasites and ectoparasites in the veterinary medicine sector and/or in the field of animal keeping. The active compounds according to the invention are applied here in a known manner, such as by oral administration in the form of, for example, tablets, capsules, drinks or granules, by dermal application in the form of, for
30 example, dipping, spraying, pouring on and spotting on, and dusting, and by parenteral administration in the form of, for example, an injection.

Accordingly, the invention also provides the use of compounds of the formula (I)' or of a salt thereof for preparing a medicament for human and/or veterinary medicine, preferably a medicament for veterinary medicine, in particular for the control of ecto- and/or endoparasites.

5 Accordingly, the compounds of the formula (I)' according to the invention can also be employed advantageously in livestock keeping (for example cattle, sheep, pigs and poultry such as chickens, geese and the like). In a preferred embodiment of the invention, the compounds, if appropriate in suitable formulations, are administered
10 orally to the animals, if appropriate together with the drinking water or feed. Since excretion in the feces is efficient, the development of insects in the animals' feces can be prevented very easily in this manner. The dosages and formulations which are suitable in each case depend, in particular, on the species and the developmental stage of the productive livestock and also on the risk of infestation
15 and can be determined readily and established by customary methods. For example, the compounds can be employed in cattle at dosages of 0.01 to 1 mg/kg of bodyweight.

In addition to the abovementioned application methods, the active compounds of the
20 formula (I)' according to the invention have excellent systemic action. Accordingly, the active compounds can also be introduced into the plants via parts of the plant, both below ground and above ground (root, stem, leaf), if the active compounds are applied, in liquid or solid form in the direct vicinity of the plant (for example granules in soil application, application in flooded rice paddies).

25 Furthermore, the active compounds according to the invention are particularly useful for the treatment of vegetative and generative plant propagation material, such as, for example, of seeds, for example of cereals, vegetables, cotton, rice, sugar beet and other crops and ornamental plants, of bulbs, seedlings and tubers of other crops
30 and ornamental plants which are propagated vegetatively. The treatment can be carried out before sowing or before planting (for example by special seed coating techniques, by dressing in liquid or solid form or as a seed box treatment), during

sowing or planting or after sowing or planting by special application techniques (for example furrow treatment). The amount of active compound used can vary within a relatively large range, depending on the application. In general, the application rates are between 1 g and 10 kg of active compound per hectare of soil surface.

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The compounds of the formula (I)' can also be employed for controlling animal pests in crops of known genetically engineered plants or genetically engineered plants yet to be developed. As a rule, the transgenic plants are distinguished by especially advantageous properties, for example by resistances to particular crop protection agents, resistances to plant diseases or pathogens of plant diseases, such as particular insects or microorganisms such as fungi, bacteria or viruses. Other particular properties concern, for example, the harvested material with regard to quantity, quality, storage properties, composition and specific constituents. Thus, transgenic plants are known where the starch content is increased, or the starch quality is altered, or where the harvested material has a different fatty acid composition.

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The use in economically important transgenic crops of useful plants and ornamentals is preferred, for example of cereals such as wheat, barley, rye, oats, millet, rice, cassava and corn or else crops of sugar beet, cotton, soybean, oilseed rape, potatoes, tomatoes, peas and other types of vegetables.

20

When used in transgenic crops, in particular those which have resistances to insects, effects are frequently observed, in addition to the effects against harmful organisms to be observed in other crops, which are specific for application in the transgenic crop in question, for example an altered or specifically widened spectrum of pests which can be controlled, or altered application rates which may be employed for application.

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The invention therefore also relates to the use of compounds of the formula (I)' for controlling harmful organisms in transgenic crop plants.

The use of the compounds according to the invention embraces, in addition to direct application onto the pests, any other application in which compounds of the formula (I)' act on the pests. Such indirect applications can, for example, be the use of compounds which, for example in the soil, the plant or the pest, decompose or are degraded into compounds of the formula (I).

In addition to their lethal effect on pests, the compounds of the formula (I)' or their salts also have a pronounced repellent effect.

A repellent for the purpose of the description is a substance or substance mixture which has a warding-off or fending-off effect on other living beings, in particular harmful pests and nuisance pests. The term also encompasses effects such as the antifeeding effect, where the intake of feed is disturbed or prevented (antifeedant effect), suppression of oviposition, or an effect on the development of the population.

The invention therefore also provides the use of compounds of the formula (I)' or their salts for achieving the abovementioned effects, in particular in the case of the pests stated in the biological examples.

The invention also provides a method for fending off, or warding off, harmful organisms, where one or more compounds of the formula (I)' or their salts are applied to the site from which the harmful organisms are to be fended off or warded off.

In the case of a plant, application may mean, for example, a treatment of the plant, but also of the seed.

As regards the effect on populations, it is interesting to note that effects can also be observed in succession during the development of a population, where summation may take place. In such a case, the individual effect itself may only have an efficacy

of markedly less than 100% but in total an efficacy of 100% is still achieved in the end.

Moreover, the compounds of the formula (I) or their salts are distinguished by the fact that the composition is usually applied earlier than in the case of a direct control, if the abovementioned effects are to be exploited. The effect frequently lasts over a long period, so that a duration of action of over 2 months is achieved.

The effects are observed in insects, arachnids and the other abovementioned pests.

Express reference is made to the contents of the German patent application 103 46 245.7, whose priority the present application claims, and the abstract involved; it is incorporated into this description by reference.

The invention is explained in detail by the examples without restricting it thereby.

Examples

A Chemical examples

General method

One equivalent of amide, one equivalent of sodium methanolate and one equivalent of the compound of the formula (III) are heated in NMP at 60 - 70°C under 100 mbar for 1 - 3 hours.

Example 1

Preparation of allyl ethoxy-N-ethylcarbamate

1.0 mol of hydroxylammonium chloride was introduced into 600 ml of water. At 15 to 20°C, 1.1 mol of NaOH were added dropwise as 45 % by weight solution until a pH of 7.5 was reached. Then, at 15-25°C and a pH of 7-8, simultaneously 1.0 mol of

allyl chloroformate and 1.0 mol of NaOH were added dropwise. After the addition was complete, the pH was adjusted to 11 and then 3.0 mol of diethyl sulfate were added over the course of 3 h, keeping the pH at 11 by adding NaOH. After the addition was complete, the mixture was stirred at 30-35°C and a pH of 11 for 2 h.

- 5 The organic phase was separated off, the aqueous phase was extracted three times with ethyl acetate, and the combined organic phases were dried and then concentrated.

Yield 93% of theory, pale oil.

- 10 Preparation of compounds of table 1 and 2:

10% by weight hydrochloric acid is slowly added dropwise until pH 5 is reached. The reaction mixture is diluted with water, and the product is extracted with ethyl acetate. The organic phase is washed with H₂O and dried, and the solvent is removed in vacuo.

15

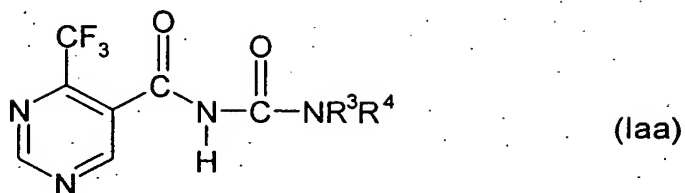
- a) Preparation of compounds of table 3:

The resulting precipitate is filtered off and washed with methanol.

The following are obtained by the general method:

Table 1:

Compounds of the formula (Iaa)



5

Compound	R ³	R ⁴
A-1	CH ₃ CH=CHCH ₂	CH ₃
A-2	CH ₂ =C(CH ₃)CH ₂	CH ₃
A-3	CH ₂ =CH(CH ₃)CH	CH ₃
A-4	CH ₂ =CHCH ₂ CH ₂	CH ₃
A-5	CH ₃ CH=C(CH ₃)CH ₂	CH ₃
A-6	CH(CH ₃)HC=CHCH ₃	CH ₃
A-7	C(CH ₃) ₂ HC=CH ₂	CH ₃
A-8	CH ₂ HC=C(CH ₃) ₂	CH ₃
A-9	CH ₃ CH=CHCH ₂ CH ₂	CH ₃
A-10	CH ₂ =CHCH ₂ CH ₂ CH ₂	CH ₃
A-11	CHC≡CCH ₂	CH ₃
A-12	CH ₃ C≡CCH ₂	CH ₃
A-13	HC≡CCH(CH ₃)	CH ₃
A-14	CH ₃ C≡CCH(CH ₃)	CH ₃
A-15	cyclo-C ₃ H ₅	CH ₃
A-16	cyclo-C ₅ H ₉	CH ₃
A-17	cyclo-C ₆ H ₁₁	CH ₃
A-18	(cyclo-C ₃ H ₅)CH ₂	CH ₃
A-19	(cyclo-C ₅ H ₉)CH ₂	CH ₃
A-20	(cyclo-C ₆ H ₁₁)CH ₂	CH ₃
A-21	PhCH ₂	CH ₃
A-22	PhCH(CH ₃)	CH ₃
A-23	PhC(CH ₃) ₂	CH ₃

Compound	R ³	R ⁴
A-24	PhCH ₂ CH ₂	CH ₃
A-25	(2-F-Ph)CH ₂	CH ₃
A-26	(3-F-Ph)CH ₂	CH ₃
A-27	(4-F-Ph)CH ₂	CH ₃
A-28	(2-Cl-Ph)CH ₂	CH ₃
A-29	(3-Cl-Ph)CH ₂	CH ₃
A-30	(4-Cl-Ph)CH ₂	CH ₃
A-31	(2-CF ₃ -Ph)CH ₂	CH ₃
A-32	(3-CF ₃ -Ph)CH ₂	CH ₃
A-33	(4-CF ₃ -Ph)CH ₂	CH ₃
A-34	(2-CH ₃ O-Ph)CH ₂	CH ₃
A-35	(3-CH ₃ O-Ph)CH ₂	CH ₃
A-36	(4-CH ₃ O-Ph)CH ₂	CH ₃
A-37	CH ₃ O	CH ₃
A-38	CH ₃ CH ₂ O	CH ₃
A-39	n-C ₃ H ₇ O	CH ₃
A-40	iso-C ₃ H ₇ O	CH ₃
A-41	CH ₂ =CHCH ₂ O	CH ₃
A-42	CH ₂ =C(CH ₃)CH ₂ O	CH ₃
A-43	CH ₂ =CHCH(CH ₃)O	CH ₃
A-44	CH ₂ =CHCH(CH ₃)O	CH ₃
A-45	CH ₂ =CHC(CH ₃) ₂ O	CH ₃
A-46	CH ₃ CH=CHCH ₂ O	CH ₃
A-47	HC≡CCH ₂ O	CH ₃
A-48	CH ₃ C≡CCH ₂ O	CH ₃
A-49	HC≡CCH(CH ₃)O	CH ₃
A-50	CH ₃ O ₂ CCH(CH ₃)O	CH ₃
A-51	CH ₃ O ₂ CC(CH ₃) ₂ O	CH ₃
A-52	CH ₃ O ₂ CCH ₂ O	CH ₃
A-53	PhCH ₂ O	CH ₃
A-54	PhO	CH ₃
A-55	Ph	CH ₃
A-56	2-F-Ph	CH ₃

Compound	R ³	R ⁴
A-57	3-F-Ph	CH ₃
A-58	4-F-Ph	CH ₃
A-59	2-Cl-Ph	CH ₃
A-60	3-Cl-Ph	CH ₃
A-61	4-Cl-Ph	CH ₃
A-62	2-Br-Ph	CH ₃
A-63	3-Br-Ph	CH ₃
A-64	4-Br-Ph	CH ₃
A-65	2-I-Ph	CH ₃
A-66	3-I-Ph	CH ₃
A-67	4-I-Ph	CH ₃
A-68	2-CF ₃ -Ph	CH ₃
A-69	3-CF ₃ -Ph	CH ₃
A-70	4-CF ₃ -Ph	CH ₃
A-71	2-CH ₃ -Ph	CH ₃
A-72	3-CH ₃ -Ph	CH ₃
A-73	4-CH ₃ -Ph	CH ₃
A-74	2-CH ₃ O-Ph	CH ₃
A-75	3-CH ₃ O-Ph	CH ₃
A-76	4-CH ₃ O-Ph	CH ₃
A-77	2-NO ₂ -Ph	CH ₃
A-78	3-NO ₂ -Ph	CH ₃
A-79	4-NO ₂ -Ph	CH ₃
A-80	2-CN-Ph	CH ₃
A-81	3-CN-Ph	CH ₃
A-82	4-CN-Ph	CH ₃
A-83	2-CO ₂ Me-Ph	CH ₃
A-84	3-CO ₂ Me-Ph	CH ₃
A-85	4-CO ₂ Me-Ph	CH ₃
A-86	2-CF ₃ O-Ph	CH ₃
A-87	3-CF ₃ O-Ph	CH ₃
A-88	4-CF ₃ O-Ph	CH ₃
A-89	4-CF ₃ CH ₂ O-Ph	CH ₃

Compound	R ³	R ⁴
A-90	4-(4-Cl-PhO)-Ph	CH ₃
A-91	4-(4-CF ₃ -PhO)-Ph	CH ₃
A-92	2,3-diCl-Ph	CH ₃
A-93	2,4-diCl-Ph	CH ₃
A-94	2,5-diCl-Ph	CH ₃
A-95	2,6-diCl-Ph	CH ₃
A-96	3,4-diCl-Ph	CH ₃
A-97	3,5-diCl-Ph	CH ₃
A-98	2-Pyridyl	CH ₃
A-99	3-Pyridyl	CH ₃
A-100	4-Pyridyl	CH ₃
A-101	2-Pyrimidyl	CH ₃
A-102	1-Pyrrolyl	CH ₃
A-103	1-Pyrazolyl	CH ₃
A-104	3-Pyrazolyl	CH ₃
A-105	1,2,4-Triazol-1-yl	CH ₃
A-106	1,2,4-Triazol-3-yl	CH ₃
A-107	2-Furanyl	CH ₃
A-108	3-Furanyl	CH ₃
A-109	2-Thienyl	CH ₃
A-110	3-Thienyl	CH ₃
A-111	2-Thiazolyl	CH ₃
A-112	1,3,4-Thiadiazol-2-yl	CH ₃
A-113	3-Isoxazolyl	CH ₃
A-114	CF ₃ CH ₂	CH ₃
A-115	ClCH ₂ CH ₂	CH ₃
A-116	ClCH ₂ CH ₂ CH ₂	CH ₃
A-117	CH ₃ OCH ₂ CH ₂	CH ₃
A-118	CH ₃ CH ₂ OCH ₂ CH ₂	CH ₃
A-119	CH ₃ OCH ₂ CH ₂ CH ₂	CH ₃
A-120	C ₂ H ₅ OCH ₂ CH ₂ CH ₂	CH ₃
A-121	n-C ₄ H ₉ OCH ₂ CH ₂ CH ₂	CH ₃
A-122	(CH ₃ O) ₂ CHCH ₂	CH ₃

Compound	R ³	R ⁴
A-123	$(\text{CH}_3\text{O})_2\text{C}=\text{CH}_2$	CH_3
A-124	$(\text{CH}_3\text{O}_2)\text{C}=\text{CH}(\text{CH}_3)$	CH_3
A-125	$\text{CH}_3\text{O}_2\text{CC}(\text{CH}_3)_2$	CH_3
A-126	NCCH_2	CH_3
A-127	$\text{NC}(\text{CH}_3)(\text{iso-C}_3\text{H}_7)\text{C}$	CH_3
A-128	$(1\text{-pyrrolidiny})\text{CH}_2\text{CH}_2$	C_2H_5
A-129	$\text{CH}_2=\text{CHCH}_2$	C_2H_5
A-130	$\text{CHC}=\text{CH}_2$	C_2H_5
A-131	$\text{CH}_3\text{C}\equiv\text{CCH}_2$	C_2H_5
A-132	$(\text{cyclo-C}_3\text{H}_5)\text{CH}_2$	C_2H_5
A-133	PhCH_2	C_2H_5
A-134	PhCH_2CH_2	C_2H_5
A-135	$(2\text{-Cl-Ph})\text{CH}_2$	C_2H_5
A-136	$(3\text{-Cl-Ph})\text{CH}_2$	C_2H_5
A-137	$(4\text{-Cl-Ph})\text{CH}_2$	C_2H_5
A-138	$(2\text{-CF}_3\text{-Ph})\text{CH}_2$	C_2H_5
A-139	$(3\text{-CF}_3\text{-Ph})\text{CH}_2$	C_2H_5
A-140	$(4\text{-CF}_3\text{-Ph})\text{CH}_2$	C_2H_5
A-141	$(2\text{-CH}_3\text{O-Ph})\text{CH}_2$	C_2H_5
A-142	$(3\text{-CH}_3\text{O-Ph})\text{CH}_2$	C_2H_5
A-143	$(4\text{-CH}_3\text{O-Ph})\text{CH}_2$	C_2H_5
A-144	CH_3O	C_2H_5
A-145	$\text{CH}_3\text{CH}_2\text{O}$	C_2H_5
A-146	$n\text{-C}_3\text{H}_7\text{O}$	C_2H_5
A-147	$\text{iso-C}_3\text{H}_7\text{O}$	C_2H_5
A-148	$\text{CH}_2=\text{CHCH}_2\text{O}$	C_2H_5
A-149	$\text{HC}\equiv\text{CCH}_2\text{O}$	C_2H_5
A-150	PhCH_2O	C_2H_5
A-151	PhO	C_2H_5
A-152	Ph	C_2H_5
A-153	2-Cl-Ph	C_2H_5
A-154	3-Cl-Ph	C_2H_5
A-155	4-Cl-Ph	C_2H_5

Compound	R ³	R ⁴
A-156	2-CF ₃ -Ph	C ₂ H ₅
A-157	3-CF ₃ -Ph	C ₂ H ₅
A-158	4-CF ₃ -Ph	C ₂ H ₅
A-159	2-CH ₃ O-Ph	C ₂ H ₅
A-160	3-CH ₃ O-Ph	C ₂ H ₅
A-161	4-CH ₃ O-Ph	C ₂ H ₅
A-162	4-CF ₃ O-Ph	C ₂ H ₅
A-163	4-CF ₃ CH ₂ O-Ph	C ₂ H ₅
A-164	4-(4-Cl-PhO)-Ph	C ₂ H ₅
A-165	4-(4-CF ₃ -PhO)-Ph	C ₂ H ₅
A-166	2,3-diCl-Ph	C ₂ H ₅
A-167	1-Pyrrolyl	C ₂ H ₅
A-168	1-Pyrazolyl	C ₂ H ₅
A-169	1,2,4-Triazol-1-yl	C ₂ H ₅
A-170	2-Thiazolyl	C ₂ H ₅
A-171	1,3,4-Thiadiazol-2-yl	C ₂ H ₅
A-172	CH ₃ O ₂ CCH ₂	C ₂ H ₅
A-173	CH ₃ O ₂ CCH(CH ₃)	C ₂ H ₅
A-174	NCCH ₂	n-C ₃ H ₇
A-175	CH ₂ =CHCH ₂	iso-C ₃ H ₇
A-176	HC≡CCH ₂	iso-C ₃ H ₇
A-177	CH ₃ C≡CCH ₂	iso-C ₃ H ₇
A-178	(cyclo-C ₃ H ₅)CH ₂	iso-C ₃ H ₇
A-179	PhCH ₂	iso-C ₃ H ₇
A-180	PhCH ₂ CH ₂	iso-C ₃ H ₇
A-181	(2-Cl-Ph)CH ₂	iso-C ₃ H ₇
A-182	(3-Cl-Ph)CH ₂	iso-C ₃ H ₇
A-183	(4-Cl-Ph)CH ₂	iso-C ₃ H ₇
A-184	(2-CF ₃ -Ph)CH ₂	iso-C ₃ H ₇
A-185	(3-CF ₃ -Ph)CH ₂	iso-C ₃ H ₇
A-186	(4-CF ₃ -Ph)CH ₂	iso-C ₃ H ₇
A-187	(2-CH ₃ O-Ph)CH ₂	iso-C ₃ H ₇
A-188	(3-CH ₃ O-Ph)CH ₂	iso-C ₃ H ₇

Compound	R ³	R ⁴
A-189	(4-CH ₃ O-Ph)CH ₂	iso-C ₃ H ₇
A-190	CH ₃ O	iso-C ₃ H ₇
A-191	CH ₃ CH ₂ O	iso-C ₃ H ₇
A-192	n-C ₃ H ₇ O	iso-C ₃ H ₇
A-193	iso-C ₃ H ₇ O	iso-C ₃ H ₇
A-194	CH ₂ =CHCH ₂ O	iso-C ₃ H ₇
A-195	HC≡CCH ₂ O	iso-C ₃ H ₇
A-196	PhCH ₂ O	iso-C ₃ H ₇
A-197	PhO	iso-C ₃ H ₇
A-198	Ph	iso-C ₃ H ₇
A-199	2-Cl-Ph	iso-C ₃ H ₇
A-200	3-Cl-Ph	iso-C ₃ H ₇
A-201	4-Cl-Ph	iso-C ₃ H ₇
A-202	2-CF ₃ -Ph	iso-C ₃ H ₇
A-203	3-CF ₃ -Ph	iso-C ₃ H ₇
A-204	4-CF ₃ -Ph	iso-C ₃ H ₇
A-205	2-CH ₃ O-Ph	iso-C ₃ H ₇
A-206	3-CH ₃ O-Ph	iso-C ₃ H ₇
A-207	4-CH ₃ O-Ph	iso-C ₃ H ₇
A-208	4-CF ₃ O-Ph	iso-C ₃ H ₇
A-209	4-CF ₃ CH ₂ O-Ph	iso-C ₃ H ₇
A-210	4-(4-Cl-PhO)-Ph	iso-C ₃ H ₇
A-211	4-(4-CF ₃ -PhO)-Ph	iso-C ₃ H ₇
A-212	2,3-diCl-Ph	iso-C ₃ H ₇
A-213	1-Pyrrolyl	iso-C ₃ H ₇
A-214	1-Pyrazolyl	iso-C ₃ H ₇
A-215	1,2,4-Triazol-1-yl	iso-C ₃ H ₇
A-216	2-Thiazolyl	iso-C ₃ H ₇
A-217	1,3,4-Thiadiazol-2-yl	iso-C ₃ H ₇
A-218	CF ₃ CH ₂	iso-C ₃ H ₇
A-219	ClCH ₂ CH ₂	iso-C ₃ H ₇
A-220	ClCH ₂ CH ₂ CH ₂	iso-C ₃ H ₇
A-221	CH ₃ OCH ₂ CH ₂	iso-C ₃ H ₇

Compound	R ³	R ⁴
A-222	CH ₃ CH ₂ OCH ₂ CH ₂	iso-C ₃ H ₇
A-223	CH ₃ OCH ₂ CH ₂ CH ₂	iso-C ₃ H ₇
A-224	C ₂ H ₅ OCH ₂ CH ₂ CH ₂	iso-C ₃ H ₇
A-225	n-C ₄ H ₉ OCH ₂ CH ₂ CH ₂	iso-C ₃ H ₇
A-226	(CH ₃ O) ₂ CHCH ₂	iso-C ₃ H ₇
A-227	CH ₃ O ₂ CCH ₂	iso-C ₃ H ₇
A-228	CH ₃ O ₂ CCH(CH ₃)	iso-C ₃ H ₇
A-229	NCCH ₂	iso-C ₃ H ₇
A-230	NC(CH ₃)(iso-C ₃ H ₇)	tert-C ₄ H ₉
A-231	CH ₂ =CHCH ₂	tert-C ₄ H ₉
A-232	CHCCH ₂	tert-C ₄ H ₉
A-233	CH ₃ CCCH ₂	tert-C ₄ H ₉
A-234	(cyclo-C ₃ H ₅)CH ₂	tert-C ₄ H ₉
A-235	PhCH ₂	tert-C ₄ H ₉
A-236	PhCH ₂ CH ₂	tert-C ₄ H ₉
A-237	(2-Cl-Ph)CH ₂	tert-C ₄ H ₉
A-238	(3-Cl-Ph)CH ₂	tert-C ₄ H ₉
A-239	(4-Cl-Ph)CH ₂	tert-C ₄ H ₉
A-240	(2-CF ₃ -Ph)CH ₂	tert-C ₄ H ₉
A-241	(3-CF ₃ -Ph)CH ₂	tert-C ₄ H ₉
A-242	(4-CF ₃ -Ph)CH ₂	tert-C ₄ H ₉
A-243	(2-CH ₃ O-Ph)CH ₂	tert-C ₄ H ₉
A-244	(3-CH ₃ O-Ph)CH ₂	tert-C ₄ H ₉
A-245	(4-CH ₃ O-Ph)CH ₂	tert-C ₄ H ₉
A-246	CH ₃ O	tert-C ₄ H ₉
A-247	CH ₃ CH ₂ O	tert-C ₄ H ₉
A-248	n-C ₃ H ₇ O	tert-C ₄ H ₉
A-249	iso-C ₃ H ₇ O	tert-C ₄ H ₉
A-250	CH ₂ =CHCH ₂ O	tert-C ₄ H ₉
A-251	HC≡CCH ₂ O	tert-C ₄ H ₉
A-252	PhCH ₂ O	tert-C ₄ H ₉
A-253	PhO	tert-C ₄ H ₉
A-254	Ph	tert-C ₄ H ₉

Compound	R ³	R ⁴
A-255	2-Cl-Ph	tert-C ₄ H ₉
A-256	3-Cl-Ph	tert-C ₄ H ₉
A-257	4-Cl-Ph	tert-C ₄ H ₉
A-258	2-CF ₃ -Ph	tert-C ₄ H ₉
A-259	3-CF ₃ -Ph	tert-C ₄ H ₉
A-260	4-CF ₃ -Ph	tert-C ₄ H ₉
A-261	2-CH ₃ O-Ph	tert-C ₄ H ₉
A-262	3-CH ₃ O-Ph	tert-C ₄ H ₉
A-263	4-CH ₃ O-Ph	tert-C ₄ H ₉
A-264	4-CF ₃ O-Ph	tert-C ₄ H ₉
A-265	4-CF ₃ CH ₂ O-Ph	tert-C ₄ H ₉
A-266	4-(4-Cl-PhO)-Ph	tert-C ₄ H ₉
A-267	4-(4-CF ₃ -PhO)-Ph	tert-C ₄ H ₉
A-268	2,3-diCl-Ph	tert-C ₄ H ₉
A-269	1-Pyrrolyl	tert-C ₄ H ₉
A-270	1-Pyrazolyl	tert-C ₄ H ₉
A-271	1,2,4-Triazol-1-yl	tert-C ₄ H ₉
A-272	2-Thiazolyl	tert-C ₄ H ₉
A-273	1,3,4-Thiadiazol-2-yl	tert-C ₄ H ₉
A-274	CH ₃ O ₂ CCH ₂	tert-C ₄ H ₉
A-275	CH ₃ O ₂ CCH(CH ₃)	tert-C ₄ H ₉
A-276	NCCH ₂	tert-C ₄ H ₉
A-277	NC(CH ₃)(iso-C ₃ H ₇)C	CH ₂ =CHCH ₂
A-278	CH ₂ =CHCH ₂	CH ₂ =CHCH ₂
A-279	HC≡CCH ₂	CH ₂ =CHCH ₂
A-280	CH ₃ CCCH ₂	CH ₂ =CHCH ₂
A-281	(cyclo-C ₃ H ₅)CH ₂	CH ₂ =CHCH ₂
A-282	PhCH ₂	CH ₂ =CHCH ₂
A-283	PhCH ₂ CH ₂	CH ₂ =CHCH ₂
A-284	(2-Cl-Ph)CH ₂	CH ₂ =CHCH ₂
A-285	(3-Cl-Ph)CH ₂	CH ₂ =CHCH ₂
A-286	(4-Cl-Ph)CH ₂	CH ₂ =CHCH ₂
A-287	(2-CF ₃ -Ph)CH ₂	CH ₂ =CHCH ₂

Compound	R ³	R ⁴
A-288	(3-CF ₃ -Ph)CH ₂	CH ₂ =CHCH ₂
A-289	(4-CF ₃ -Ph)CH ₂	CH ₂ =CHCH ₂
A-290	(2-CH ₃ O-Ph)CH ₂	CH ₂ =CHCH ₂
A-291	(3-CH ₃ O-Ph)CH ₂	CH ₂ =CHCH ₂
A-292	(4-CH ₃ O-Ph)CH ₂	CH ₂ =CHCH ₂
A-293	CH ₃ O	CH ₂ =CHCH ₂
A-294	CH ₃ CH ₂ O	CH ₂ =CHCH ₂
A-295	n-C ₃ H ₇ O	CH ₂ =CHCH ₂
A-296	iso-C ₃ H ₇ O	CH ₂ =CHCH ₂
A-297	CH ₂ =CHCH ₂ O	CH ₂ =CHCH ₂
A-298	CHCCH ₂ O	CH ₂ =CHCH ₂
A-299	PhCH ₂ O	CH ₂ =CHCH ₂
A-300	PhO	CH ₂ =CHCH ₂
A-301	Ph	CH ₂ =CHCH ₂
A-302	2-Cl-Ph	CH ₂ =CHCH ₂
A-303	3-Cl-Ph	CH ₂ =CHCH ₂
A-304	4-Cl-Ph	CH ₂ =CHCH ₂
A-305	2-CF ₃ -Ph	CH ₂ =CHCH ₂
A-306	3-CF ₃ -Ph	CH ₂ =CHCH ₂
A-307	4-CF ₃ -Ph	CH ₂ =CHCH ₂
A-308	2-CH ₃ O-Ph	CH ₂ =CHCH ₂
A-309	3-CH ₃ O-Ph	CH ₂ =CHCH ₂
A-310	4-CH ₃ O-Ph	CH ₂ =CHCH ₂
A-311	4-CF ₃ O-Ph	CH ₂ =CHCH ₂
A-312	4-CF ₃ CH ₂ O-Ph	CH ₂ =CHCH ₂
A-313	4-(4-Cl-PhO)-Ph	CH ₂ =CHCH ₂
A-314	4-(4-CF ₃ -PhO)-Ph	CH ₂ =CHCH ₂
A-315	2,3-diCl-Ph	CH ₂ =CHCH ₂
A-316	1-Pyrrolyl	CH ₂ =CHCH ₂
A-317	1-Pyrazolyl	CH ₂ =CHCH ₂
A-318	1,2,4-Triazol-1-yl	CH ₂ =CHCH ₂
A-319	2-Thiazolyl	CH ₂ =CHCH ₂
A-320	1,3,4-Thiadiazol-2-yl	CH ₂ =CHCH ₂

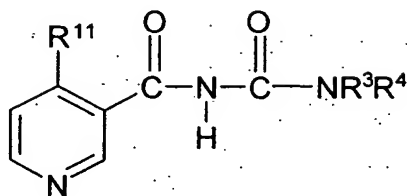
Compound	R ³	R ⁴
A-321	CF ₃ CH ₂	CH ₂ =CHCH ₂
A-322	ClCH ₂ CH ₂	CH ₂ =CHCH ₂
A-323	ClCH ₂ CH ₂ CH ₂	CH ₂ =CHCH ₂
A-324	CH ₃ OCH ₂ CH ₂	CH ₂ =CHCH ₂
A-325	CH ₃ CH ₂ OCH ₂ CH ₂	CH ₂ =CHCH ₂
A-326	CH ₃ OCH ₂ CH ₂ CH ₂	CH ₂ =CHCH ₂
A-327	C ₂ H ₅ OCH ₂ CH ₂ CH ₂	CH ₂ =CHCH ₂
A-328	n-C ₄ H ₉ OCH ₂ CH ₂ CH ₂	CH ₂ =CHCH ₂
A-329	(CH ₃ O) ₂ CHCH ₂	CH ₂ =CHCH ₂
A-330	CH ₃ O ₂ CCH ₂	CH ₂ =CHCH ₂
A-331	CH ₃ O ₂ CCH(CH ₃)	CH ₂ =CHCH ₂
A-332	NCCH ₂	CH ₂ =CHCH ₂
A-333	NC(CH ₃)(iso-C ₃ H ₇)C	PhCH ₂
A-334	CH ₂ =CHCH ₂	PhCH ₂
A-335	HC≡CCH ₂	PhCH ₂
A-336	CH ₃ C≡CCH ₂	PhCH ₂
A-337	(cyclo-C ₃ H ₅)CH ₂	PhCH ₂
A-338	PhCH ₂	PhCH ₂
A-339	PhCH ₂ CH ₂	PhCH ₂
A-340	(2-Cl-Ph)CH ₂	PhCH ₂
A-341	(3-Cl-Ph)CH ₂	PhCH ₂
A-342	(4-Cl-Ph)CH ₂	PhCH ₂
A-343	(2-CF ₃ -Ph)CH ₂	PhCH ₂
A-344	(3-CF ₃ -Ph)CH ₂	PhCH ₂
A-345	(4-CF ₃ -Ph)CH ₂	PhCH ₂
A-346	(2-CH ₃ O-Ph)CH ₂	PhCH ₂
A-347	(3-CH ₃ O-Ph)CH ₂	PhCH ₂
A-348	(4-CH ₃ O-Ph)CH ₂	PhCH ₂
A-349	CH ₃ O	PhCH ₂
A-350	CH ₃ CH ₂ O	PhCH ₂
A-351	n-C ₃ H ₇ O	PhCH ₂
A-352	iso-C ₃ H ₇ O	PhCH ₂
A-353	CH ₂ =CHCH ₂ O	PhCH ₂

Compound	R ³	R ⁴
A-354	CHCCH ₂ O	PhCH ₂
A-355	PhCH ₂ O	PhCH ₂
A-356	PhO	PhCH ₂
A-357	Ph	PhCH ₂
A-358	2-Cl-Ph	PhCH ₂
A-359	3-Cl-Ph	PhCH ₂
A-360	4-Cl-Ph	PhCH ₂
A-361	2-CF ₃ -Ph	PhCH ₂
A-362	3-CF ₃ -Ph	PhCH ₂
A-363	4-CF ₃ -Ph	PhCH ₂
A-364	2-CH ₃ O-Ph	PhCH ₂
A-365	3-CH ₃ O-Ph	PhCH ₂
A-366	4-CH ₃ O-Ph	PhCH ₂
A-367	4-CF ₃ O-Ph	PhCH ₂
A-368	4-CF ₃ CH ₂ O-Ph	PhCH ₂
A-369	4-(4-Cl-PhO)-Ph	PhCH ₂
A-370	4-(4-CF ₃ -PhO)-Ph	PhCH ₂
A-371	2,3-diCl-Ph	PhCH ₂
A-372	1-Pyrrolyl	PhCH ₂
A-373	1-Pyrazolyl	PhCH ₂
A-374	1,2,4-Triazol-1-yl	PhCH ₂
A-375	2-Thiazolyl	PhCH ₂
A-376	1,3,4-Thiadiazol-2-yl	PhCH ₂
A-377	CF ₃ CH ₂	PhCH ₂
A-378	ClCH ₂ CH ₂	PhCH ₂
A-379	ClCH ₂ CH ₂ CH ₂	PhCH ₂
A-380	CH ₃ OCH ₂ CH ₂	PhCH ₂
A-381	CH ₃ CH ₂ OCH ₂ CH ₂	PhCH ₂
A-382	CH ₃ OCH ₂ CH ₂ CH ₂	PhCH ₂
A-383	C ₂ H ₅ OCH ₂ CH ₂ CH ₂	PhCH ₂
A-384	n-C ₄ H ₉ OCH ₂ CH ₂ CH ₂	PhCH ₂
A-385	(CH ₃ O) ₂ CHCH ₂	PhCH ₂
A-386	CH(CH ₃)CH ₂ CH ₂ CH ₂ CH ₂	

Compound	R ³	R ⁴
A-387	CH ₂ CHBrCH ₂ CH ₂	
A-388	CH ₂ CH(OH)CH ₂ CH ₂	
A-389	CH ₂ CH=CHCH ₂	
A-390	Ph	Ph
A-391	CH ₃ SO ₂ OCH ₂ CH ₂ CH ₂ CH ₂	H
A-392	CH ₂ CH ₂ CH ₂ CH ₂ CH ₂	
A-393	CH ₂ CH ₂ OCH ₂ CH ₂	
A-394	CH ₂ CH ₂ SCH ₂ CH ₂	
A-395	CH ₂ CH ₂ NHCH ₂ CH ₂	
A-396	CH ₂ CH ₂ N(CH ₃)CH ₂ CH ₂	
A-397	N=CHCH ₂ CH ₂	

Table 2

Compounds of the formula (Ibb)



(Ibb)

5

 $R^{11} = \text{CHF}_2$ (compounds B1 - B 397) or CF_2Cl (compounds C1 - C 397)

Compound	R^3	R^4
B-1 / C-1	$\text{CH}_3\text{CH}=\text{CHCH}_2$	CH_3
B-1 / C-2	$\text{CH}_2=\text{C}(\text{CH}_3)\text{CH}_2$	CH_3
B-1 / C-3	$\text{CH}_2=\text{CH}(\text{CH}_3)\text{CH}$	CH_3
B-1 / C-4	$\text{CH}_2=\text{CHCH}_2\text{CH}_2$	CH_3
B-1 / C-5	$\text{CH}_3\text{CH}=\text{C}(\text{CH}_3)\text{CH}_2$	CH_3
B-1 / C-6	$\text{CH}(\text{CH}_3)\text{HC}=\text{CHCH}_3$	CH_3
B-1 / C-7	$\text{C}(\text{CH}_3)_2\text{HC}=\text{CH}_2$	CH_3
B-1 / C-8	$\text{CH}_2\text{HC}=\text{C}(\text{CH}_3)_2$	CH_3
B-1 / C-9	$\text{CH}_3\text{CH}=\text{CHCH}_2\text{CH}_2$	CH_3
B-1 / C- 10	$\text{CH}_2=\text{CHCH}_2\text{CH}_2\text{CH}_2$	CH_3
B-1 / C- 11	$\text{CHC}\equiv\text{CCH}_2$	CH_3
B-1 / C- 12	$\text{CH}_3\text{C}\equiv\text{CCH}_2$	CH_3
B-1 / C- 13	$\text{HC}\equiv\text{CCH}(\text{CH}_3)$	CH_3
B-1 / C- 14	$\text{CH}_3\text{C}\equiv\text{CCH}(\text{CH}_3)$	CH_3
B-1 / C- 15	cyclo- C_3H_5	CH_3
B-1 / C- 16	cyclo- C_5H_9	CH_3
B-1 / C- 17	cyclo- C_6H_{11}	CH_3
B-1 / C- 18	(cyclo- C_3H_5) CH_2	CH_3
B-1 / C- 19	(cyclo- C_5H_9) CH_2	CH_3
B-1 / C- 20	(cyclo- C_6H_{11}) CH_2	CH_3
B-1 / C- 21	PhCH_2	CH_3

Compound	R ³	R ⁴
B-1 / C- 22	PhCH(CH ₃)	CH ₃
B-1 / C- 23	PhC(CH ₃) ₂	CH ₃
B-1 / C- 24	PhCH ₂ CH ₂	CH ₃
B-1 / C- 25	(2-F-Ph)CH ₂	CH ₃
B-1 / C- 26	(3-F-Ph)CH ₂	CH ₃
B-1 / C- 27	(4-F-Ph)CH ₂	CH ₃
B-1 / C- 28	(2-Cl-Ph)CH ₂	CH ₃
B-1 / C- 29	(3-Cl-Ph)CH ₂	CH ₃
B-1 / C- 30	(4-Cl-Ph)CH ₂	CH ₃
B-1 / C- 31	(2-CF ₃ -Ph)CH ₂	CH ₃
B-1 / C- 32	(3-CF ₃ -Ph)CH ₂	CH ₃
B-1 / C- 33	(4-CF ₃ -Ph)CH ₂	CH ₃
B-1 / C- 34	(2-CH ₃ O-Ph)CH ₂	CH ₃
B-1 / C- 35	(3-CH ₃ O-Ph)CH ₂	CH ₃
B-1 / C- 36	(4-CH ₃ O-Ph)CH ₂	CH ₃
B-1 / C- 37	CH ₃ O	CH ₃
B-1 / C- 38	CH ₃ CH ₂ O	CH ₃
B-1 / C- 39	n-C ₃ H ₇ O	CH ₃
B-1 / C- 40	iso-C ₃ H ₇ O	CH ₃
B-1 / C- 41	CH ₂ =CHCH ₂ O	CH ₃
B-1 / C- 42	CH ₂ =C(CH ₃)CH ₂ O	CH ₃
B-1 / C- 43	CH ₂ =CHCH(CH ₃)O	CH ₃
B-1 / C- 44	CH ₂ =CHCH(CH ₃)O	CH ₃
B-1 / C- 45	CH ₂ =CHC(CH ₃) ₂ O	CH ₃
B-1 / C- 46	CH ₃ CH=CHCH ₂ O	CH ₃
B-1 / C- 47	HC≡CCH ₂ O	CH ₃
B-1 / C- 48	CH ₃ C≡CCH ₂ O	CH ₃
B-1 / C- 49	HC≡CCH(CH ₃)O	CH ₃
B-1 / C- 50	CH ₃ O ₂ CCH(CH ₃)O	CH ₃
B-1 / C- 51	CH ₃ O ₂ CC(CH ₃) ₂ O	CH ₃
B-1 / C- 52	CH ₃ O ₂ CCH ₂ O	CH ₃
B-1 / C- 53	PhCH ₂ O	CH ₃
B-1 / C- 54	PhO	CH ₃

Compound	R ³	R ⁴
B-1 / C- 55	Ph	CH ₃
B-1 / C- 56	2-F-Ph	CH ₃
B-1 / C- 57	3-F-Ph	CH ₃
B-1 / C- 58	4-F-Ph	CH ₃
B-1 / C- 59	2-Cl-Ph	CH ₃
B-1 / C- 60	3-Cl-Ph	CH ₃
B-1 / C- 61	4-Cl-Ph	CH ₃
B-1 / C- 62	2-Br-Ph	CH ₃
B-1 / C- 63	3-Br-Ph	CH ₃
B-1 / C- 64	4-Br-Ph	CH ₃
B-1 / C- 65	2-I-Ph	CH ₃
B-1 / C- 66	3-I-Ph	CH ₃
B-1 / C- 67	4-I-Ph	CH ₃
B-1 / C- 68	2-CF ₃ -Ph	CH ₃
B-1 / C- 69	3-CF ₃ -Ph	CH ₃
B-1 / C- 70	4-CF ₃ -Ph	CH ₃
B-1 / C- 71	2-CH ₃ -Ph	CH ₃
B-1 / C- 72	3-CH ₃ -Ph	CH ₃
B-1 / C- 73	4-CH ₃ -Ph	CH ₃
B-1 / C- 74	2-CH ₃ O-Ph	CH ₃
B-1 / C- 75	3-CH ₃ O-Ph	CH ₃
B-1 / C- 76	4-CH ₃ O-Ph	CH ₃
B-1 / C- 77	2-NO ₂ -Ph	CH ₃
B-1 / C- 78	3-NO ₂ -Ph	CH ₃
B-1 / C- 79	4-NO ₂ -Ph	CH ₃
B-1 / C- 80	2-CN-Ph	CH ₃
B-1 / C- 81	3-CN-Ph	CH ₃
B-1 / C- 82	4-CN-Ph	CH ₃
B-1 / C- 83	2-CO ₂ Me-Ph	CH ₃
B-1 / C- 84	3-CO ₂ Me-Ph	CH ₃
B-1 / C- 85	4-CO ₂ Me-Ph	CH ₃
B-1 / C- 86	2-CF ₃ O-Ph	CH ₃
B-1 / C- 87	3-CF ₃ O-Ph	CH ₃

Compound	R ³	R ⁴
B-1 / C- 88	4-CF ₃ O-Ph	CH ₃
B-1 / C- 89	4-CF ₃ CH ₂ O-Ph	CH ₃
B-1 / C- 90	4-(4-Cl-PhO)-Ph	CH ₃
B-1 / C- 91	4-(4-CF ₃ -PhO)-Ph	CH ₃
B-1 / C- 92	2,3-diCl-Ph	CH ₃
B-1 / C- 93	2,4-diCl-Ph	CH ₃
B-1 / C- 94	2,5-diCl-Ph	CH ₃
B-1 / C- 95	2,6-diCl-Ph	CH ₃
B-1 / C- 96	3,4-diCl-Ph	CH ₃
B-1 / C- 97	3,5-diCl-Ph	CH ₃
B-1 / C- 98	2-Pyridyl	CH ₃
B-1 / C- 99	3-Pyridyl	CH ₃
B-1 / C- 100	4-Pyridyl	CH ₃
B-1 / C- 101	2-Pyrimidyl	CH ₃
B-1 / C- 102	1-Pyrrolyl	CH ₃
B-1 / C- 103	1-Pyrazolyl	CH ₃
B-1 / C- 104	3-Pyrazolyl	CH ₃
B-1 / C- 105	1,2,4-Triazol-1-yl	CH ₃
B-1 / C- 106	1,2,4-Triazol-3-yl	CH ₃
B-1 / C- 107	2-Furanyl	CH ₃
B-1 / C- 108	3-Furanyl	CH ₃
B-1 / C- 109	2-Thienyl	CH ₃
B-1 / C- 110	3-Thienyl	CH ₃
B-1 / C- 111	2-Thiazolyl	CH ₃
B-1 / C- 112	1,3,4-Thiadiazol-2-yl	CH ₃
B-1 / C- 113	3-Isoxazolyl	CH ₃
B-1 / C- 114	CF ₃ CH ₂	CH ₃
B-1 / C- 115	ClCH ₂ CH ₂	CH ₃
B-1 / C- 116	ClCH ₂ CH ₂ CH ₂	CH ₃
B-1 / C- 117	CH ₃ OCH ₂ CH ₂	CH ₃
B-1 / C- 118	CH ₃ CH ₂ OCH ₂ CH ₂	CH ₃
B-1 / C- 119	CH ₃ OCH ₂ CH ₂ CH ₂	CH ₃
B-1 / C- 120	C ₂ H ₅ OCH ₂ CH ₂ CH ₂	CH ₃

Compound	R ³	R ⁴
B-1 / C- 121	n-C ₄ H ₉ OCH ₂ CH ₂ CH ₂	CH ₃
122	(CH ₃ O) ₂ CHCH ₂	CH ₃
123	(CH ₃ O) ₂ C=CH ₂	CH ₃
124	(CH ₃ O ₂)C=CH(CH ₃)	CH ₃
125	CH ₃ O ₂ CC(CH ₃) ₂	CH ₃
126	NCCH ₂	CH ₃
127	NC(CH ₃)(iso-C ₃ H ₇)C	CH ₃
128	(1-pyrrolidiny)CH ₂ CH ₂	C ₂ H ₅
129	CH ₂ =CHCH ₂	C ₂ H ₅
130	CHC=CH ₂	C ₂ H ₅
131	CH ₃ C≡CCH ₂	C ₂ H ₅
132	(cyclo-C ₃ H ₅)CH ₂	C ₂ H ₅
133	PhCH ₂	C ₂ H ₅
134	PhCH ₂ CH ₂	C ₂ H ₅
135	(2-Cl-Ph)CH ₂	C ₂ H ₅
136	(3-Cl-Ph)CH ₂	C ₂ H ₅
137	(4-Cl-Ph)CH ₂	C ₂ H ₅
138	(2-CF ₃ -Ph)CH ₂	C ₂ H ₅
139	(3-CF ₃ -Ph)CH ₂	C ₂ H ₅
140	(4-CF ₃ -Ph)CH ₂	C ₂ H ₅
141	(2-CH ₃ O-Ph)CH ₂	C ₂ H ₅
142	(3-CH ₃ O-Ph)CH ₂	C ₂ H ₅
143	(4-CH ₃ O-Ph)CH ₂	C ₂ H ₅
144	CH ₃ O	C ₂ H ₅
145	CH ₃ CH ₂ O	C ₂ H ₅
146	n-C ₃ H ₇ O	C ₂ H ₅
147	iso-C ₃ H ₇ O	C ₂ H ₅
148	CH ₂ =CHCH ₂ O	C ₂ H ₅
149	HC≡CCH ₂ O	C ₂ H ₅
150	PhCH ₂ O	C ₂ H ₅
151	PhO	C ₂ H ₅
152	Ph	C ₂ H ₅
153	2-Cl-Ph	C ₂ H ₅

Compound	R ³	R ⁴
B-1 / C- 154	3-Cl-Ph	C ₂ H ₅
B-1 / C- 155	4-Cl-Ph	C ₂ H ₅
B-1 / C- 156	2-CF ₃ -Ph	C ₂ H ₅
B-1 / C- 157	3-CF ₃ -Ph	C ₂ H ₅
B-1 / C- 158	4-CF ₃ -Ph	C ₂ H ₅
B-1 / C- 159	2-CH ₃ O-Ph	C ₂ H ₅
B-1 / C- 160	3-CH ₃ O-Ph	C ₂ H ₅
B-1 / C- 161	4-CH ₃ O-Ph	C ₂ H ₅
B-1 / C- 162	4-CF ₃ O-Ph	C ₂ H ₅
B-1 / C- 163	4-CF ₃ CH ₂ O-Ph	C ₂ H ₅
B-1 / C- 164	4-(4-Cl-PhO)-Ph	C ₂ H ₅
B-1 / C- 165	4-(4-CF ₃ -PhO)-Ph	C ₂ H ₅
B-1 / C- 166	2,3-diCl-Ph	C ₂ H ₅
B-1 / C- 167	1-Pyrrolyl	C ₂ H ₅
B-1 / C- 168	1-Pyrazolyl	C ₂ H ₅
B-1 / C- 169	1,2,4-Triazol-1-yl	C ₂ H ₅
B-1 / C- 170	2-Thiazolyl	C ₂ H ₅
B-1 / C- 171	1,3,4-Thiadiazol-2-yl	C ₂ H ₅
B-1 / C- 172	CH ₃ O ₂ CCH ₂	C ₂ H ₅
B-1 / C- 173	CH ₃ O ₂ CCH(CH ₃)	C ₂ H ₅
B-1 / C- 174	NCCH ₂	n-C ₃ H ₇
B-1 / C- 175	CH ₂ =CHCH ₂	iso-C ₃ H ₇
B-1 / C- 176	HC≡CCH ₂	iso-C ₃ H ₇
B-1 / C- 177	CH ₃ C≡CCH ₂	iso-C ₃ H ₇
B-1 / C- 178	(cyclo-C ₃ H ₅)CH ₂	iso-C ₃ H ₇
B-1 / C- 179	PhCH ₂	iso-C ₃ H ₇
B-1 / C- 180	PhCH ₂ CH ₂	iso-C ₃ H ₇
B-1 / C- 181	(2-Cl-Ph)CH ₂	iso-C ₃ H ₇
B-1 / C- 182	(3-Cl-Ph)CH ₂	iso-C ₃ H ₇
B-1 / C- 183	(4-Cl-Ph)CH ₂	iso-C ₃ H ₇
B-1 / C- 184	(2-CF ₃ -Ph)CH ₂	iso-C ₃ H ₇
B-1 / C- 185	(3-CF ₃ -Ph)CH ₂	iso-C ₃ H ₇
B-1 / C- 186	(4-CF ₃ -Ph)CH ₂	iso-C ₃ H ₇

Compound	R ³	R ⁴
B-1 / C- 187	(2-CH ₃ O-Ph)CH ₂	iso-C ₃ H ₇
B-1 / C- 188	(3-CH ₃ O-Ph)CH ₂	iso-C ₃ H ₇
B-1 / C- 189	(4-CH ₃ O-Ph)CH ₂	iso-C ₃ H ₇
B-1 / C- 190	CH ₃ O	iso-C ₃ H ₇
B-1 / C- 191	CH ₃ CH ₂ O	iso-C ₃ H ₇
B-1 / C- 192	n-C ₃ H ₇ O	iso-C ₃ H ₇
B-1 / C- 193	iso-C ₃ H ₇ O	iso-C ₃ H ₇
B-1 / C- 194	CH ₂ =CHCH ₂ O	iso-C ₃ H ₇
B-1 / C- 195	HC≡CCH ₂ O	iso-C ₃ H ₇
B-1 / C- 196	PhCH ₂ O	iso-C ₃ H ₇
B-1 / C- 197	PhO	iso-C ₃ H ₇
B-1 / C- 198	Ph	iso-C ₃ H ₇
B-1 / C- 199	2-Cl-Ph	iso-C ₃ H ₇
B-1 / C- 200	3-Cl-Ph	iso-C ₃ H ₇
B-1 / C- 201	4-Cl-Ph	iso-C ₃ H ₇
B-1 / C- 202	2-CF ₃ -Ph	iso-C ₃ H ₇
B-1 / C- 203	3-CF ₃ -Ph	iso-C ₃ H ₇
B-1 / C- 204	4-CF ₃ -Ph	iso-C ₃ H ₇
B-1 / C- 205	2-CH ₃ O-Ph	iso-C ₃ H ₇
B-1 / C- 206	3-CH ₃ O-Ph	iso-C ₃ H ₇
B-1 / C- 207	4-CH ₃ O-Ph	iso-C ₃ H ₇
B-1 / C- 208	4-CF ₃ O-Ph	iso-C ₃ H ₇
B-1 / C- 209	4-CF ₃ CH ₂ O-Ph	iso-C ₃ H ₇
B-1 / C- 210	4-(4-Cl-PhO)-Ph	iso-C ₃ H ₇
B-1 / C- 211	4-(4-CF ₃ -PhO)-Ph	iso-C ₃ H ₇
B-1 / C- 212	2,3-diCl-Ph	iso-C ₃ H ₇
B-1 / C- 213	1-Pyrrolyl	iso-C ₃ H ₇
B-1 / C- 214	1-Pyrazolyl	iso-C ₃ H ₇
B-1 / C- 215	1,2,4-Triazol-1-yl	iso-C ₃ H ₇
B-1 / C- 216	2-Thiazolyl	iso-C ₃ H ₇
B-1 / C- 217	1,3,4-Thiadiazol-2-yl	iso-C ₃ H ₇
B-1 / C- 218	CF ₃ CH ₂	iso-C ₃ H ₇
B-1 / C- 219	ClCH ₂ CH ₂	iso-C ₃ H ₇

Compound	R ³	R ⁴
B-1 / C- 220	ClCH ₂ CH ₂ CH ₂	iso-C ₃ H ₇
B-1 / C- 221	CH ₃ OCH ₂ CH ₂	iso-C ₃ H ₇
B-1 / C- 222	CH ₃ CH ₂ OCH ₂ CH ₂	iso-C ₃ H ₇
B-1 / C- 223	CH ₃ OCH ₂ CH ₂ CH ₂	iso-C ₃ H ₇
B-1 / C- 224	C ₂ H ₅ OCH ₂ CH ₂ CH ₂	iso-C ₃ H ₇
B-1 / C- 225	n-C ₄ H ₉ OCH ₂ CH ₂ CH ₂	iso-C ₃ H ₇
B-1 / C- 226	(CH ₃ O) ₂ CHCH ₂	iso-C ₃ H ₇
B-1 / C- 227	CH ₃ O ₂ CCH ₂	iso-C ₃ H ₇
B-1 / C- 228	CH ₃ O ₂ CCH(CH ₃)	iso-C ₃ H ₇
B-1 / C- 229	NCCH ₂	iso-C ₃ H ₇
B-1 / C- 230	NC(CH ₃)(iso-C ₃ H ₇)	tert-C ₄ H ₉
B-1 / C- 231	CH ₂ =CHCH ₂	tert-C ₄ H ₉
B-1 / C- 232	CHCCH ₂	tert-C ₄ H ₉
B-1 / C- 233	CH ₃ CCCH ₂	tert-C ₄ H ₉
B-1 / C- 234	(cyclo-C ₃ H ₅)CH ₂	tert-C ₄ H ₉
B-1 / C- 235	PhCH ₂	tert-C ₄ H ₉
B-1 / C- 236	PhCH ₂ CH ₂	tert-C ₄ H ₉
B-1 / C- 237	(2-Cl-Ph)CH ₂	tert-C ₄ H ₉
B-1 / C- 238	(3-Cl-Ph)CH ₂	tert-C ₄ H ₉
B-1 / C- 239	(4-Cl-Ph)CH ₂	tert-C ₄ H ₉
B-1 / C- 240	(2-CF ₃ -Ph)CH ₂	tert-C ₄ H ₉
B-1 / C- 241	(3-CF ₃ -Ph)CH ₂	tert-C ₄ H ₉
B-1 / C- 242	(4-CF ₃ -Ph)CH ₂	tert-C ₄ H ₉
B-1 / C- 243	(2-CH ₃ O-Ph)CH ₂	tert-C ₄ H ₉
B-1 / C- 244	(3-CH ₃ O-Ph)CH ₂	tert-C ₄ H ₉
B-1 / C- 245	(4-CH ₃ O-Ph)CH ₂	tert-C ₄ H ₉
B-1 / C- 246	CH ₃ O	tert-C ₄ H ₉
B-1 / C- 247	CH ₃ CH ₂ O	tert-C ₄ H ₉
B-1 / C- 248	n-C ₃ H ₇ O	tert-C ₄ H ₉
B-1 / C- 249	iso-C ₃ H ₇ O	tert-C ₄ H ₉
B-1 / C- 250	CH ₂ =CHCH ₂ O	tert-C ₄ H ₉
B-1 / C- 251	HC≡CCH ₂ O	tert-C ₄ H ₉
B-1 / C- 252	PhCH ₂ O	tert-C ₄ H ₉

Compound	R ³	R ⁴
B-1 / C- 253	PhO	tert-C ₄ H ₉
B-1 / C- 254	Ph	tert-C ₄ H ₉
B-1 / C- 255	2-Cl-Ph	tert-C ₄ H ₉
B-1 / C- 256	3-Cl-Ph	tert-C ₄ H ₉
B-1 / C- 257	4-Cl-Ph	tert-C ₄ H ₉
B-1 / C- 258	2-CF ₃ -Ph	tert-C ₄ H ₉
B-1 / C- 259	3-CF ₃ -Ph	tert-C ₄ H ₉
B-1 / C- 260	4-CF ₃ -Ph	tert-C ₄ H ₉
B-1 / C- 261	2-CH ₃ O-Ph	tert-C ₄ H ₉
B-1 / C- 262	3-CH ₃ O-Ph	tert-C ₄ H ₉
B-1 / C- 263	4-CH ₃ O-Ph	tert-C ₄ H ₉
B-1 / C- 264	4-CF ₃ O-Ph	tert-C ₄ H ₉
B-1 / C- 265	4-CF ₃ CH ₂ O-Ph	tert-C ₄ H ₉
B-1 / C- 266	4-(4-Cl-PhO)-Ph	tert-C ₄ H ₉
B-1 / C- 267	4-(4-CF ₃ -PhO)-Ph	tert-C ₄ H ₉
B-1 / C- 268	2,3-diCl-Ph	tert-C ₄ H ₉
B-1 / C- 269	1-Pyrrolyl	tert-C ₄ H ₉
B-1 / C- 270	1-Pyrazolyl	tert-C ₄ H ₉
B-1 / C- 271	1,2,4-Triazol-1-yl	tert-C ₄ H ₉
B-1 / C- 272	2-Thiazolyl	tert-C ₄ H ₉
B-1 / C- 273	1,3,4-Thiadiazol-2-yl	tert-C ₄ H ₉
B-1 / C- 274	CH ₃ O ₂ CCH ₂	tert-C ₄ H ₉
B-1 / C- 275	CH ₃ O ₂ CCH(CH ₃)	tert-C ₄ H ₉
B-1 / C- 276	NCCH ₂	tert-C ₄ H ₉
B-1 / C- 277	NC(CH ₃)(iso-C ₃ H ₇)C	CH ₂ =CHCH ₂
B-1 / C- 278	CH ₂ =CHCH ₂	CH ₂ =CHCH ₂
B-1 / C- 279	HC≡CCH ₂	CH ₂ =CHCH ₂
B-1 / C- 280	CH ₃ CCCH ₂	CH ₂ =CHCH ₂
B-1 / C- 281	(cyclo-C ₃ H ₅)CH ₂	CH ₂ =CHCH ₂
B-1 / C- 282	PhCH ₂	CH ₂ =CHCH ₂
B-1 / C- 283	PhCH ₂ CH ₂	CH ₂ =CHCH ₂
B-1 / C- 284	(2-Cl-Ph)CH ₂	CH ₂ =CHCH ₂
B-1 / C- 285	(3-Cl-Ph)CH ₂	CH ₂ =CHCH ₂

Compound	R ³	R ⁴
B-1 / C- 286	(4-Cl-Ph)CH ₂	CH ₂ =CHCH ₂
B-1 / C- 287	(2-CF ₃ -Ph)CH ₂	CH ₂ =CHCH ₂
B-1 / C- 288	(3-CF ₃ -Ph)CH ₂	CH ₂ =CHCH ₂
B-1 / C- 289	(4-CF ₃ -Ph)CH ₂	CH ₂ =CHCH ₂
B-1 / C- 290	(2-CH ₃ O-Ph)CH ₂	CH ₂ =CHCH ₂
B-1 / C- 291	(3-CH ₃ O-Ph)CH ₂	CH ₂ =CHCH ₂
B-1 / C- 292	(4-CH ₃ O-Ph)CH ₂	CH ₂ =CHCH ₂
B-1 / C- 293	CH ₃ O	CH ₂ =CHCH ₂
B-1 / C- 294	CH ₃ CH ₂ O	CH ₂ =CHCH ₂
B-1 / C- 295	n-C ₃ H ₇ O	CH ₂ =CHCH ₂
B-1 / C- 296	iso-C ₃ H ₇ O	CH ₂ =CHCH ₂
B-1 / C- 297	CH ₂ =CHCH ₂ O	CH ₂ =CHCH ₂
B-1 / C- 298	CHCCH ₂ O	CH ₂ =CHCH ₂
B-1 / C- 299	PhCH ₂ O	CH ₂ =CHCH ₂
B-1 / C- 300	PhO	CH ₂ =CHCH ₂
B-1 / C- 301	Ph	CH ₂ =CHCH ₂
B-1 / C- 302	2-Cl-Ph	CH ₂ =CHCH ₂
B-1 / C- 303	3-Cl-Ph	CH ₂ =CHCH ₂
B-1 / C- 304	4-Cl-Ph	CH ₂ =CHCH ₂
B-1 / C- 305	2-CF ₃ -Ph	CH ₂ =CHCH ₂
B-1 / C- 306	3-CF ₃ -Ph	CH ₂ =CHCH ₂
B-1 / C- 307	4-CF ₃ -Ph	CH ₂ =CHCH ₂
B-1 / C- 308	2-CH ₃ O-Ph	CH ₂ =CHCH ₂
B-1 / C- 309	3-CH ₃ O-Ph	CH ₂ =CHCH ₂
B-1 / C- 310	4-CH ₃ O-Ph	CH ₂ =CHCH ₂
B-1 / C- 311	4-CF ₃ O-Ph	CH ₂ =CHCH ₂
B-1 / C- 312	4-CF ₃ CH ₂ O-Ph	CH ₂ =CHCH ₂
B-1 / C- 313	4-(4-Cl-PhO)-Ph	CH ₂ =CHCH ₂
B-1 / C- 314	4-(4-CF ₃ -PhO)-Ph	CH ₂ =CHCH ₂
B-1 / C- 315	2,3-diCl-Ph	CH ₂ =CHCH ₂
B-1 / C- 316	1-Pyrrolyl	CH ₂ =CHCH ₂
B-1 / C- 317	1-Pyrazolyl	CH ₂ =CHCH ₂
B-1 / C- 318	1,2,4-Triazol-1-yl	CH ₂ =CHCH ₂

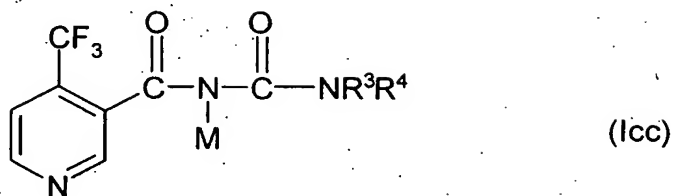
Compound	R ³	R ⁴
B-1 / C- 319	2-Thiazolyl	CH ₂ =CHCH ₂
B-1 / C- 320	1,3,4-Thiadiazol-2-yl	CH ₂ =CHCH ₂
B-1 / C- 321	CF ₃ CH ₂	CH ₂ =CHCH ₂
B-1 / C- 322	ClCH ₂ CH ₂	CH ₂ =CHCH ₂
B-1 / C- 323	ClCH ₂ CH ₂ CH ₂	CH ₂ =CHCH ₂
B-1 / C- 324	CH ₃ OCH ₂ CH ₂	CH ₂ =CHCH ₂
B-1 / C- 325	CH ₃ CH ₂ OCH ₂ CH ₂	CH ₂ =CHCH ₂
B-1 / C- 326	CH ₃ OCH ₂ CH ₂ CH ₂	CH ₂ =CHCH ₂
B-1 / C- 327	C ₂ H ₅ OCH ₂ CH ₂ CH ₂	CH ₂ =CHCH ₂
B-1 / C- 328	n-C ₄ H ₉ OCH ₂ CH ₂ CH ₂	CH ₂ =CHCH ₂
B-1 / C- 329	(CH ₃ O) ₂ CHCH ₂	CH ₂ =CHCH ₂
B-1 / C- 330	CH ₃ O ₂ CCH ₂	CH ₂ =CHCH ₂
B-1 / C- 331	CH ₃ O ₂ CCH(CH ₃)	CH ₂ =CHCH ₂
B-1 / C- 332	NCCH ₂	CH ₂ =CHCH ₂
B-1 / C- 333	NC(CH ₃)(iso-C ₃ H ₇)C	PhCH ₂
B-1 / C- 334	CH ₂ =CHCH ₂	PhCH ₂
B-1 / C- 335	HC≡CCH ₂	PhCH ₂
B-1 / C- 336	CH ₃ C≡CCH ₂	PhCH ₂
B-1 / C- 337	(cyclo-C ₃ H ₅)CH ₂	PhCH ₂
B-1 / C- 338	PhCH ₂	PhCH ₂
B-1 / C- 339	PhCH ₂ CH ₂	PhCH ₂
B-1 / C- 340	(2-Cl-Ph)CH ₂	PhCH ₂
B-1 / C- 341	(3-Cl-Ph)CH ₂	PhCH ₂
B-1 / C- 342	(4-Cl-Ph)CH ₂	PhCH ₂
B-1 / C- 343	(2-CF ₃ -Ph)CH ₂	PhCH ₂
B-1 / C- 344	(3-CF ₃ -Ph)CH ₂	PhCH ₂
B-1 / C- 345	(4-CF ₃ -Ph)CH ₂	PhCH ₂
B-1 / C- 346	(2-CH ₃ O-Ph)CH ₂	PhCH ₂
B-1 / C- 347	(3-CH ₃ O-Ph)CH ₂	PhCH ₂
B-1 / C- 348	(4-CH ₃ O-Ph)CH ₂	PhCH ₂
B-1 / C- 349	CH ₃ O	PhCH ₂
B-1 / C- 350	CH ₃ CH ₂ O	PhCH ₂
B-1 / C- 351	n-C ₃ H ₇ O	PhCH ₂

Compound	R ³	R ⁴
B-1 / C- 352	iso-C ₃ H ₇ O	PhCH ₂
B-1 / C- 353	CH ₂ =CHCH ₂ O	PhCH ₂
B-1 / C- 354	CHCCH ₂ O	PhCH ₂
B-1 / C- 355	PhCH ₂ O	PhCH ₂
B-1 / C- 356	PhO	PhCH ₂
B-1 / C- 357	Ph	PhCH ₂
B-1 / C- 358	2-Cl-Ph	PhCH ₂
B-1 / C- 359	3-Cl-Ph	PhCH ₂
B-1 / C- 360	4-Cl-Ph	PhCH ₂
B-1 / C- 361	2-CF ₃ -Ph	PhCH ₂
B-1 / C- 362	3-CF ₃ -Ph	PhCH ₂
B-1 / C- 363	4-CF ₃ -Ph	PhCH ₂
B-1 / C- 364	2-CH ₃ O-Ph	PhCH ₂
B-1 / C- 365	3-CH ₃ O-Ph	PhCH ₂
B-1 / C- 366	4-CH ₃ O-Ph	PhCH ₂
B-1 / C- 367	4-CF ₃ O-Ph	PhCH ₂
B-1 / C- 368	4-CF ₃ CH ₂ O-Ph	PhCH ₂
B-1 / C- 369	4-(4-Cl-PhO)-Ph	PhCH ₂
B-1 / C- 370	4-(4-CF ₃ -PhO)-Ph	PhCH ₂
B-1 / C- 371	2,3-diCl-Ph	PhCH ₂
B-1 / C- 372	1-Pyrrolyl	PhCH ₂
B-1 / C- 373	1-Pyrazolyl	PhCH ₂
B-1 / C- 374	1,2,4-Triazol-1-yl	PhCH ₂
B-1 / C- 375	2-Thiazolyl	PhCH ₂
B-1 / C- 376	1,3,4-Thiadiazol-2-yl	PhCH ₂
B-1 / C- 377	CF ₃ CH ₂	PhCH ₂
B-1 / C- 378	ClCH ₂ CH ₂	PhCH ₂
B-1 / C- 379	ClCH ₂ CH ₂ CH ₂	PhCH ₂
B-1 / C- 380	CH ₃ OCH ₂ CH ₂	PhCH ₂
B-1 / C- 381	CH ₃ CH ₂ OCH ₂ CH ₂	PhCH ₂
B-1 / C- 382	CH ₃ OCH ₂ CH ₂ CH ₂	PhCH ₂
B-1 / C- 383	C ₂ H ₅ OCH ₂ CH ₂ CH ₂	PhCH ₂
B-1 / C- 384	n-C ₄ H ₉ OCH ₂ CH ₂ CH ₂	PhCH ₂

Compound	R ³	R ⁴
B-1 / C- 385	(CH ₃ O) ₂ CHCH ₂	PhCH ₂
B-1 / C- 386	CH(CH ₃)CH ₂ CH ₂ CH ₂ CH ₂	
B-1 / C- 387	CH ₂ CHBrCH ₂ CH ₂	
B-1 / C- 388	CH ₂ CH(OH)CH ₂ CH ₂	
B-1 / C- 389	CH ₂ CH=CHCH ₂	
B-1 / C- 390	Ph	Ph
B-1 / C- 391	CH ₃ SO ₂ OCH ₂ CH ₂ CH ₂ CH ₂	H
B-1 / C- 392	CH ₂ CH ₂ CH ₂ CH ₂ CH ₂	
B-1 / C- 393	CH ₂ CH ₂ OCH ₂ CH ₂	
B-1 / C- 394	CH ₂ CH ₂ SCH ₂ CH ₂	
B-1 / C- 395	CH ₂ CH ₂ NHCH ₂ CH ₂	
B-1 / C- 396	CH ₂ CH ₂ N(CH ₃)CH ₂ CH ₂	
B-1 / C- 397	N=CHCH ₂ CH ₂	

Table 3

Compounds of the formula (Icc)



5

M = Na (compounds D-1-D-397) or K (compounds E-1-E-397)

Compound	R ³	R ⁴
D-1 / E-1	CH ₃ CH=CHCH ₂	CH ₃
D-1 / E-2	CH ₂ =C(CH ₃)CH ₂	CH ₃
D-1 / E-3	CH ₂ =CH(CH ₃)CH	CH ₃
D-1 / E-4	CH ₂ =CHCH ₂ CH ₂	CH ₃
D-1 / E-5	CH ₃ CH=C(CH ₃)CH ₂	CH ₃
D-1 / E-6	CH(CH ₃)HC=CHCH ₃	CH ₃
D-1 / E-7	C(CH ₃) ₂ HC=CH ₂	CH ₃
D-1 / E-8	CH ₂ HC=C(CH ₃) ₂	CH ₃
D-1 / E-9	CH ₃ CH=CHCH ₂ CH ₂	CH ₃
D-1 / E- 10	CH ₂ =CHCH ₂ CH ₂ CH ₂	CH ₃
D-1 / E- 11	CHC≡CCH ₂	CH ₃
D-1 / E- 12	CH ₃ C≡CCH ₂	CH ₃
D-1 / E- 13	HC≡CCH(CH ₃)	CH ₃
D-1 / E- 14	CH ₃ C≡CCH(CH ₃)	CH ₃
D-1 / E- 15	cyclo-C ₃ H ₅	CH ₃
D-1 / E- 16	cyclo-C ₅ H ₉	CH ₃
D-1 / E- 17	cyclo-C ₆ H ₁₁	CH ₃
D-1 / E- 18	(cyclo-C ₃ H ₅)CH ₂	CH ₃
D-1 / E- 19	(cyclo-C ₅ H ₉)CH ₂	CH ₃
D-1 / E- 20	(cyclo-C ₆ H ₁₁)CH ₂	CH ₃
D-1 / E- 21	PhCH ₂	CH ₃
D-1 / E- 22	PhCH(CH ₃)	CH ₃

Compound	R ³	R ⁴
D-1 / E- 23	PhC(CH ₃) ₂	CH ₃
D-1 / E- 24	PhCH ₂ CH ₂	CH ₃
D-1 / E- 25	(2-F-Ph)CH ₂	CH ₃
D-1 / E- 26	(3-F-Ph)CH ₂	CH ₃
D-1 / E- 27	(4-F-Ph)CH ₂	CH ₃
D-1 / E- 28	(2-Cl-Ph)CH ₂	CH ₃
D-1 / E- 29	(3-Cl-Ph)CH ₂	CH ₃
D-1 / E- 30	(4-Cl-Ph)CH ₂	CH ₃
D-1 / E- 31	(2-CF ₃ -Ph)CH ₂	CH ₃
D-1 / E- 32	(3-CF ₃ -Ph)CH ₂	CH ₃
D-1 / E- 33	(4-CF ₃ -Ph)CH ₂	CH ₃
D-1 / E- 34	(2-CH ₃ O-Ph)CH ₂	CH ₃
D-1 / E- 35	(3-CH ₃ O-Ph)CH ₂	CH ₃
D-1 / E- 36	(4-CH ₃ O-Ph)CH ₂	CH ₃
D-1 / E- 37	CH ₃ O	CH ₃
D-1 / E- 38	CH ₃ CH ₂ O	CH ₃
D-1 / E- 39	n-C ₃ H ₇ O	CH ₃
D-1 / E- 40	iso-C ₃ H ₇ O	CH ₃
D-1 / E- 41	CH ₂ =CHCH ₂ O	CH ₃
D-1 / E- 42	CH ₂ =C(CH ₃)CH ₂ O	CH ₃
D-1 / E- 43	CH ₂ =CHCH(CH ₃)O	CH ₃
D-1 / E- 44	CH ₂ =CHCH(CH ₃)O	CH ₃
D-1 / E- 45	CH ₂ =CHC(CH ₃) ₂ O	CH ₃
D-1 / E- 46	CH ₃ CH=CHCH ₂ O	CH ₃
D-1 / E- 47	HC≡CCH ₂ O	CH ₃
D-1 / E- 48	CH ₃ C≡CCH ₂ O	CH ₃
D-1 / E- 49	HC≡CCH(CH ₃)O	CH ₃
D-1 / E- 50	CH ₃ O ₂ CCH(CH ₃)O	CH ₃
D-1 / E- 51	CH ₃ O ₂ CC(CH ₃) ₂ O	CH ₃
D-1 / E- 52	CH ₃ O ₂ CCH ₂ O	CH ₃
D-1 / E- 53	PhCH ₂ O	CH ₃
D-1 / E- 54	PhO	CH ₃
D-1 / E- 55	Ph	CH ₃

Compound	R ³	R ⁴
D-1 / E- 56	2-F-Ph	CH ₃
D-1 / E- 57	3-F-Ph	CH ₃
D-1 / E- 58	4-F-Ph	CH ₃
D-1 / E- 59	2-Cl-Ph	CH ₃
D-1 / E- 60	3-Cl-Ph	CH ₃
D-1 / E- 61	4-Cl-Ph	CH ₃
D-1 / E- 62	2-Br-Ph	CH ₃
D-1 / E- 63	3-Br-Ph	CH ₃
D-1 / E- 64	4-Br-Ph	CH ₃
D-1 / E- 65	2-I-Ph	CH ₃
D-1 / E- 66	3-I-Ph	CH ₃
D-1 / E- 67	4-I-Ph	CH ₃
D-1 / E- 68	2-CF ₃ -Ph	CH ₃
D-1 / E- 69	3-CF ₃ -Ph	CH ₃
D-1 / E- 70	4-CF ₃ -Ph	CH ₃
D-1 / E- 71	2-CH ₃ -Ph	CH ₃
D-1 / E- 72	3-CH ₃ -Ph	CH ₃
D-1 / E- 73	4-CH ₃ -Ph	CH ₃
D-1 / E- 74	2-CH ₃ O-Ph	CH ₃
D-1 / E- 75	3-CH ₃ O-Ph	CH ₃
D-1 / E- 76	4-CH ₃ O-Ph	CH ₃
D-1 / E- 77	2-NO ₂ -Ph	CH ₃
D-1 / E- 78	3-NO ₂ -Ph	CH ₃
D-1 / E- 79	4-NO ₂ -Ph	CH ₃
D-1 / E- 80	2-CN-Ph	CH ₃
D-1 / E- 81	3-CN-Ph	CH ₃
D-1 / E- 82	4-CN-Ph	CH ₃
D-1 / E- 83	2-CO ₂ Me-Ph	CH ₃
D-1 / E- 84	3-CO ₂ Me-Ph	CH ₃
D-1 / E- 85	4-CO ₂ Me-Ph	CH ₃
D-1 / E- 86	2-CF ₃ O-Ph	CH ₃
D-1 / E- 87	3-CF ₃ O-Ph	CH ₃
D-1 / E- 88	4-CF ₃ O-Ph	CH ₃

Compound	R ³	R ⁴
D-1 / E- 89	4-CF ₃ CH ₂ O-Ph	CH ₃
D-1 / E- 90	4-(4-Cl-PhO)-Ph	CH ₃
D-1 / E- 91	4-(4-CF ₃ -PhO)-Ph	CH ₃
D-1 / E- 92	2,3-diCl-Ph	CH ₃
D-1 / E- 93	2,4-diCl-Ph	CH ₃
D-1 / E- 94	2,5-diCl-Ph	CH ₃
D-1 / E- 95	2,6-diCl-Ph	CH ₃
D-1 / E- 96	3,4-diCl-Ph	CH ₃
D-1 / E- 97	3,5-diCl-Ph	CH ₃
D-1 / E- 98	2-Pyridyl	CH ₃
D-1 / E- 99	3-Pyridyl	CH ₃
D-1 / E- 100	4-Pyridyl	CH ₃
D-1 / E- 101	2-Pyrimidyl	CH ₃
D-1 / E- 102	1-Pyrrolyl	CH ₃
D-1 / E- 103	1-Pyrazolyl	CH ₃
D-1 / E- 104	3-Pyrazolyl	CH ₃
D-1 / E- 105	1,2,4-Triazol-1-yl	CH ₃
D-1 / E- 106	1,2,4-Triazol-3-yl	CH ₃
D-1 / E- 107	2-Furanyl	CH ₃
D-1 / E- 108	3-Furanyl	CH ₃
D-1 / E- 109	2-Thienyl	CH ₃
D-1 / E- 110	3-Thienyl	CH ₃
D-1 / E- 111	2-Thiazolyl	CH ₃
D-1 / E- 112	1,3,4-Thiadiazol-2-yl	CH ₃
D-1 / E- 113	3-Isoxazolyl	CH ₃
D-1 / E- 114	CF ₃ CH ₂	CH ₃
D-1 / E- 115	ClCH ₂ CH ₂	CH ₃
D-1 / E- 116	ClCH ₂ CH ₂ CH ₂	CH ₃
D-1 / E- 117	CH ₃ OCH ₂ CH ₂	CH ₃
D-1 / E- 118	CH ₃ CH ₂ OCH ₂ CH ₂	CH ₃
D-1 / E- 119	CH ₃ OCH ₂ CH ₂ CH ₂	CH ₃
D-1 / E- 120	C ₂ H ₅ OCH ₂ CH ₂ CH ₂	CH ₃
D-1 / E- 121	n-C ₄ H ₉ OCH ₂ CH ₂ CH ₂	CH ₃

Compound	R ³	R ⁴
D-1 / E- 122	(CH ₃ O) ₂ CHCH ₂	CH ₃
D-1 / E- 123	(CH ₃ O) ₂ C=CH ₂	CH ₃
D-1 / E- 124	(CH ₃ O ₂)C=CH(CH ₃)	CH ₃
D-1 / E- 125	CH ₃ O ₂ CC(CH ₃) ₂	CH ₃
D-1 / E- 126	NCCH ₂	CH ₃
D-1 / E- 127	NC(CH ₃)(iso-C ₃ H ₇)C	CH ₃
D-1 / E- 128	(1-pyrrolidiny)CH ₂ CH ₂	C ₂ H ₅
D-1 / E- 129	CH ₂ =CHCH ₂	C ₂ H ₅
D-1 / E- 130	CHC=CH ₂	C ₂ H ₅
D-1 / E- 131	CH ₃ C≡CCH ₂	C ₂ H ₅
D-1 / E- 132	(cyclo-C ₃ H ₅)CH ₂	C ₂ H ₅
D-1 / E- 133	PhCH ₂	C ₂ H ₅
D-1 / E- 134	PhCH ₂ CH ₂	C ₂ H ₅
D-1 / E- 135	(2-Cl-Ph)CH ₂	C ₂ H ₅
D-1 / E- 136	(3-Cl-Ph)CH ₂	C ₂ H ₅
D-1 / E- 137	(4-Cl-Ph)CH ₂	C ₂ H ₅
D-1 / E- 138	(2-CF ₃ -Ph)CH ₂	C ₂ H ₅
D-1 / E- 139	(3-CF ₃ -Ph)CH ₂	C ₂ H ₅
D-1 / E- 140	(4-CF ₃ -Ph)CH ₂	C ₂ H ₅
D-1 / E- 141	(2-CH ₃ O-Ph)CH ₂	C ₂ H ₅
D-1 / E- 142	(3-CH ₃ O-Ph)CH ₂	C ₂ H ₅
D-1 / E- 143	(4-CH ₃ O-Ph)CH ₂	C ₂ H ₅
D-1 / E- 144	CH ₃ O	C ₂ H ₅
D-1 / E- 145	CH ₃ CH ₂ O	C ₂ H ₅
D-1 / E- 146	n-C ₃ H ₇ O	C ₂ H ₅
D-1 / E- 147	iso-C ₃ H ₇ O	C ₂ H ₅
D-1 / E- 148	CH ₂ =CHCH ₂ O	C ₂ H ₅
D-1 / E- 149	HC≡CCH ₂ O	C ₂ H ₅
D-1 / E- 150	PhCH ₂ O	C ₂ H ₅
D-1 / E- 151	PhO	C ₂ H ₅
D-1 / E- 152	Ph	C ₂ H ₅
D-1 / E- 153	2-Cl-Ph	C ₂ H ₅
D-1 / E- 154	3-Cl-Ph	C ₂ H ₅

Compound	R ³	R ⁴
D-1 / E- 155	4-Cl-Ph	C ₂ H ₅
D-1 / E- 156	2-CF ₃ -Ph	C ₂ H ₅
D-1 / E- 157	3-CF ₃ -Ph	C ₂ H ₅
D-1 / E- 158	4-CF ₃ -Ph	C ₂ H ₅
D-1 / E- 159	2-CH ₃ O-Ph	C ₂ H ₅
D-1 / E- 160	3-CH ₃ O-Ph	C ₂ H ₅
D-1 / E- 161	4-CH ₃ O-Ph	C ₂ H ₅
D-1 / E- 162	4-CF ₃ O-Ph	C ₂ H ₅
D-1 / E- 163	4-CF ₃ CH ₂ O-Ph	C ₂ H ₅
D-1 / E- 164	4-(4-Cl-PhO)-Ph	C ₂ H ₅
D-1 / E- 165	4-(4-CF ₃ -PhO)-Ph	C ₂ H ₅
D-1 / E- 166	2,3-diCl-Ph	C ₂ H ₅
D-1 / E- 167	1-Pyrrolyl	C ₂ H ₅
D-1 / E- 168	1-Pyrazolyl	C ₂ H ₅
D-1 / E- 169	1,2,4-Triazol-1-yl	C ₂ H ₅
D-1 / E- 170	2-Thiazolyl	C ₂ H ₅
D-1 / E- 171	1,3,4-Thiadiazol-2-yl	C ₂ H ₅
D-1 / E- 172	CH ₃ O ₂ CCH ₂	C ₂ H ₅
D-1 / E- 173	CH ₃ O ₂ CCH(CH ₃)	C ₂ H ₅
D-1 / E- 174	NCCH ₂	n-C ₃ H ₇
D-1 / E- 175	CH ₂ =CHCH ₂	iso-C ₃ H ₇
D-1 / E- 176	HC≡CCH ₂	iso-C ₃ H ₇
D-1 / E- 177	CH ₃ C≡CCH ₂	iso-C ₃ H ₇
D-1 / E- 178	(cyclo-C ₃ H ₅)CH ₂	iso-C ₃ H ₇
D-1 / E- 179	PhCH ₂	iso-C ₃ H ₇
D-1 / E- 180	PhCH ₂ CH ₂	iso-C ₃ H ₇
D-1 / E- 181	(2-Cl-Ph)CH ₂	iso-C ₃ H ₇
D-1 / E- 182	(3-Cl-Ph)CH ₂	iso-C ₃ H ₇
D-1 / E- 183	(4-Cl-Ph)CH ₂	iso-C ₃ H ₇
D-1 / E- 184	(2-CF ₃ -Ph)CH ₂	iso-C ₃ H ₇
D-1 / E- 185	(3-CF ₃ -Ph)CH ₂	iso-C ₃ H ₇
D-1 / E- 186	(4-CF ₃ -Ph)CH ₂	iso-C ₃ H ₇
D-1 / E- 187	(2-CH ₃ O-Ph)CH ₂	iso-C ₃ H ₇

Compound	R ³	R ⁴
D-1 / E- 188	(3-CH ₃ O-Ph)CH ₂	iso-C ₃ H ₇
D-1 / E- 189	(4-CH ₃ O-Ph)CH ₂	iso-C ₃ H ₇
D-1 / E- 190	CH ₃ O	iso-C ₃ H ₇
D-1 / E- 191	CH ₃ CH ₂ O	iso-C ₃ H ₇
D-1 / E- 192	n-C ₃ H ₇ O	iso-C ₃ H ₇
D-1 / E- 193	iso-C ₃ H ₇ O	iso-C ₃ H ₇
D-1 / E- 194	CH ₂ =CHCH ₂ O	iso-C ₃ H ₇
D-1 / E- 195	HC≡CCH ₂ O	iso-C ₃ H ₇
D-1 / E- 196	PhCH ₂ O	iso-C ₃ H ₇
D-1 / E- 197	PhO	iso-C ₃ H ₇
D-1 / E- 198	Ph	iso-C ₃ H ₇
D-1 / E- 199	2-Cl-Ph	iso-C ₃ H ₇
D-1 / E- 200	3-Cl-Ph	iso-C ₃ H ₇
D-1 / E- 201	4-Cl-Ph	iso-C ₃ H ₇
D-1 / E- 202	2-CF ₃ -Ph	iso-C ₃ H ₇
D-1 / E- 203	3-CF ₃ -Ph	iso-C ₃ H ₇
D-1 / E- 204	4-CF ₃ -Ph	iso-C ₃ H ₇
D-1 / E- 205	2-CH ₃ O-Ph	iso-C ₃ H ₇
D-1 / E- 206	3-CH ₃ O-Ph	iso-C ₃ H ₇
D-1 / E- 207	4-CH ₃ O-Ph	iso-C ₃ H ₇
D-1 / E- 208	4-CF ₃ O-Ph	iso-C ₃ H ₇
D-1 / E- 209	4-CF ₃ CH ₂ O-Ph	iso-C ₃ H ₇
D-1 / E- 210	4-(4-Cl-PhO)-Ph	iso-C ₃ H ₇
D-1 / E- 211	4-(4-CF ₃ -PhO)-Ph	iso-C ₃ H ₇
D-1 / E- 212	2,3-diCl-Ph	iso-C ₃ H ₇
D-1 / E- 213	1-Pyrrolyl	iso-C ₃ H ₇
D-1 / E- 214	1-Pyrazolyl	iso-C ₃ H ₇
D-1 / E- 215	1,2,4-Triazol-1-yl	iso-C ₃ H ₇
D-1 / E- 216	2-Thiazolyl	iso-C ₃ H ₇
D-1 / E- 217	1,3,4-Thiadiazol-2-yl	iso-C ₃ H ₇
D-1 / E- 218	CF ₃ CH ₂	iso-C ₃ H ₇
D-1 / E- 219	ClCH ₂ CH ₂	iso-C ₃ H ₇
D-1 / E- 220	ClCH ₂ CH ₂ CH ₂	iso-C ₃ H ₇

Compound	R ³	R ⁴
D-1 / E- 221	CH ₃ OCH ₂ CH ₂	iso-C ₃ H ₇
D-1 / E- 222	CH ₃ CH ₂ OCH ₂ CH ₂	iso-C ₃ H ₇
D-1 / E- 223	CH ₃ OCH ₂ CH ₂ CH ₂	iso-C ₃ H ₇
D-1 / E- 224	C ₂ H ₅ OCH ₂ CH ₂ CH ₂	iso-C ₃ H ₇
D-1 / E- 225	n-C ₄ H ₉ OCH ₂ CH ₂ CH ₂	iso-C ₃ H ₇
D-1 / E- 226	(CH ₃ O) ₂ CHCH ₂	iso-C ₃ H ₇
D-1 / E- 227	CH ₃ O ₂ CCH ₂	iso-C ₃ H ₇
D-1 / E- 228	CH ₃ O ₂ CCH(CH ₃)	iso-C ₃ H ₇
D-1 / E- 229	NCCH ₂	iso-C ₃ H ₇
D-1 / E- 230	NC(CH ₃)(iso-C ₃ H ₇)	tert-C ₄ H ₉
D-1 / E- 231	CH ₂ =CHCH ₂	tert-C ₄ H ₉
D-1 / E- 232	CHCCH ₂	tert-C ₄ H ₉
D-1 / E- 233	CH ₃ CCCH ₂	tert-C ₄ H ₉
D-1 / E- 234	(cyclo-C ₃ H ₅)CH ₂	tert-C ₄ H ₉
D-1 / E- 235	PhCH ₂	tert-C ₄ H ₉
D-1 / E- 236	PhCH ₂ CH ₂	tert-C ₄ H ₉
D-1 / E- 237	(2-Cl-Ph)CH ₂	tert-C ₄ H ₉
D-1 / E- 238	(3-Cl-Ph)CH ₂	tert-C ₄ H ₉
D-1 / E- 239	(4-Cl-Ph)CH ₂	tert-C ₄ H ₉
D-1 / E- 240	(2-CF ₃ -Ph)CH ₂	tert-C ₄ H ₉
D-1 / E- 241	(3-CF ₃ -Ph)CH ₂	tert-C ₄ H ₉
D-1 / E- 242	(4-CF ₃ -Ph)CH ₂	tert-C ₄ H ₉
D-1 / E- 243	(2-CH ₃ O-Ph)CH ₂	tert-C ₄ H ₉
D-1 / E- 244	(3-CH ₃ O-Ph)CH ₂	tert-C ₄ H ₉
D-1 / E- 245	(4-CH ₃ O-Ph)CH ₂	tert-C ₄ H ₉
D-1 / E- 246	CH ₃ O	tert-C ₄ H ₉
D-1 / E- 247	CH ₃ CH ₂ O	tert-C ₄ H ₉
D-1 / E- 248	n-C ₃ H ₇ O	tert-C ₄ H ₉
D-1 / E- 249	iso-C ₃ H ₇ O	tert-C ₄ H ₉
D-1 / E- 250	CH ₂ =CHCH ₂ O	tert-C ₄ H ₉
D-1 / E- 251	HC≡CCH ₂ O	tert-C ₄ H ₉
D-1 / E- 252	PhCH ₂ O	tert-C ₄ H ₉
D-1 / E- 253	PhO	tert-C ₄ H ₉

Compound	R ³	R ⁴
D-1 / E- 254	Ph	tert-C ₄ H ₉
D-1 / E- 255	2-Cl-Ph	tert-C ₄ H ₉
D-1 / E- 256	3-Cl-Ph	tert-C ₄ H ₉
D-1 / E- 257	4-Cl-Ph	tert-C ₄ H ₉
D-1 / E- 258	2-CF ₃ -Ph	tert-C ₄ H ₉
D-1 / E- 259	3-CF ₃ -Ph	tert-C ₄ H ₉
D-1 / E- 260	4-CF ₃ -Ph	tert-C ₄ H ₉
D-1 / E- 261	2-CH ₃ O-Ph	tert-C ₄ H ₉
D-1 / E- 262	3-CH ₃ O-Ph	tert-C ₄ H ₉
D-1 / E- 263	4-CH ₃ O-Ph	tert-C ₄ H ₉
D-1 / E- 264	4-CF ₃ O-Ph	tert-C ₄ H ₉
D-1 / E- 265	4-CF ₃ CH ₂ O-Ph	tert-C ₄ H ₉
D-1 / E- 266	4-(4-Cl-PhO)-Ph	tert-C ₄ H ₉
D-1 / E- 267	4-(4-CF ₃ -PhO)-Ph	tert-C ₄ H ₉
D-1 / E- 268	2,3-diCl-Ph	tert-C ₄ H ₉
D-1 / E- 269	1-Pyrrolyl	tert-C ₄ H ₉
D-1 / E- 270	1-Pyrazolyl	tert-C ₄ H ₉
D-1 / E- 271	1,2,4-Triazol-1-yl	tert-C ₄ H ₉
D-1 / E- 272	2-Thiazolyl	tert-C ₄ H ₉
D-1 / E- 273	1,3,4-Thiadiazol-2-yl	tert-C ₄ H ₉
D-1 / E- 274	CH ₃ O ₂ CCH ₂	tert-C ₄ H ₉
D-1 / E- 275	CH ₃ O ₂ CCH(CH ₃)	tert-C ₄ H ₉
D-1 / E- 276	NCCH ₂	tert-C ₄ H ₉
D-1 / E- 277	NC(CH ₃)(iso-C ₃ H ₇)C	CH ₂ =CHCH ₂
D-1 / E- 278	CH ₂ =CHCH ₂	CH ₂ =CHCH ₂
D-1 / E- 279	HC≡CCH ₂	CH ₂ =CHCH ₂
D-1 / E- 280	CH ₃ CCCH ₂	CH ₂ =CHCH ₂
D-1 / E- 281	(cyclo-C ₃ H ₅)CH ₂	CH ₂ =CHCH ₂
D-1 / E- 282	PhCH ₂	CH ₂ =CHCH ₂
D-1 / E- 283	PhCH ₂ CH ₂	CH ₂ =CHCH ₂
D-1 / E- 284	(2-Cl-Ph)CH ₂	CH ₂ =CHCH ₂
D-1 / E- 285	(3-Cl-Ph)CH ₂	CH ₂ =CHCH ₂
D-1 / E- 286	(4-Cl-Ph)CH ₂	CH ₂ =CHCH ₂

Compound	R ³	R ⁴
D-1 / E- 287	(2-CF ₃ -Ph)CH ₂	CH ₂ =CHCH ₂
D-1 / E- 288	(3-CF ₃ -Ph)CH ₂	CH ₂ =CHCH ₂
D-1 / E- 289	(4-CF ₃ -Ph)CH ₂	CH ₂ =CHCH ₂
D-1 / E- 290	(2-CH ₃ O-Ph)CH ₂	CH ₂ =CHCH ₂
D-1 / E- 291	(3-CH ₃ O-Ph)CH ₂	CH ₂ =CHCH ₂
D-1 / E- 292	(4-CH ₃ O-Ph)CH ₂	CH ₂ =CHCH ₂
D-1 / E- 293	CH ₃ O	CH ₂ =CHCH ₂
D-1 / E- 294	CH ₃ CH ₂ O	CH ₂ =CHCH ₂
D-1 / E- 295	n-C ₃ H ₇ O	CH ₂ =CHCH ₂
D-1 / E- 296	iso-C ₃ H ₇ O	CH ₂ =CHCH ₂
D-1 / E- 297	CH ₂ =CHCH ₂ O	CH ₂ =CHCH ₂
D-1 / E- 298	CHCCH ₂ O	CH ₂ =CHCH ₂
D-1 / E- 299	PhCH ₂ O	CH ₂ =CHCH ₂
D-1 / E- 300	PhO	CH ₂ =CHCH ₂
D-1 / E- 301	Ph	CH ₂ =CHCH ₂
D-1 / E- 302	2-Cl-Ph	CH ₂ =CHCH ₂
D-1 / E- 303	3-Cl-Ph	CH ₂ =CHCH ₂
D-1 / E- 304	4-Cl-Ph	CH ₂ =CHCH ₂
D-1 / E- 305	2-CF ₃ -Ph	CH ₂ =CHCH ₂
D-1 / E- 306	3-CF ₃ -Ph	CH ₂ =CHCH ₂
D-1 / E- 307	4-CF ₃ -Ph	CH ₂ =CHCH ₂
D-1 / E- 308	2-CH ₃ O-Ph	CH ₂ =CHCH ₂
D-1 / E- 309	3-CH ₃ O-Ph	CH ₂ =CHCH ₂
D-1 / E- 310	4-CH ₃ O-Ph	CH ₂ =CHCH ₂
D-1 / E- 311	4-CF ₃ O-Ph	CH ₂ =CHCH ₂
D-1 / E- 312	4-CF ₃ CH ₂ O-Ph	CH ₂ =CHCH ₂
D-1 / E- 313	4-(4-Cl-PhO)-Ph	CH ₂ =CHCH ₂
D-1 / E- 314	4-(4-CF ₃ -PhO)-Ph	CH ₂ =CHCH ₂
D-1 / E- 315	2,3-diCl-Ph	CH ₂ =CHCH ₂
D-1 / E- 316	1-Pyrrolyl	CH ₂ =CHCH ₂
D-1 / E- 317	1-Pyrazolyl	CH ₂ =CHCH ₂
D-1 / E- 318	1,2,4-Triazol-1-yl	CH ₂ =CHCH ₂
D-1 / E- 319	2-Thiazolyl	CH ₂ =CHCH ₂

Compound	R ³	R ⁴
D-1 / E- 320	1,3,4-Thiadiazol-2-yl	CH ₂ =CHCH ₂
D-1 / E- 321	CF ₃ CH ₂	CH ₂ =CHCH ₂
D-1 / E- 322	ClCH ₂ CH ₂	CH ₂ =CHCH ₂
D-1 / E- 323	ClCH ₂ CH ₂ CH ₂	CH ₂ =CHCH ₂
D-1 / E- 324	CH ₃ OCH ₂ CH ₂	CH ₂ =CHCH ₂
D-1 / E- 325	CH ₃ CH ₂ OCH ₂ CH ₂	CH ₂ =CHCH ₂
D-1 / E- 326	CH ₃ OCH ₂ CH ₂ CH ₂	CH ₂ =CHCH ₂
D-1 / E- 327	C ₂ H ₅ OCH ₂ CH ₂ CH ₂	CH ₂ =CHCH ₂
D-1 / E- 328	n-C ₄ H ₉ OCH ₂ CH ₂ CH ₂	CH ₂ =CHCH ₂
D-1 / E- 329	(CH ₃ O) ₂ CHCH ₂	CH ₂ =CHCH ₂
D-1 / E- 330	CH ₃ O ₂ CCH ₂	CH ₂ =CHCH ₂
D-1 / E- 331	CH ₃ O ₂ CCH(CH ₃)	CH ₂ =CHCH ₂
D-1 / E- 332	NCCH ₂	CH ₂ =CHCH ₂
D-1 / E- 333	NC(CH ₃)(iso-C ₃ H ₇)C	PhCH ₂
D-1 / E- 334	CH ₂ =CHCH ₂	PhCH ₂
D-1 / E- 335	HC≡CCH ₂	PhCH ₂
D-1 / E- 336	CH ₃ C≡CCH ₂	PhCH ₂
D-1 / E- 337	(cyclo-C ₃ H ₅)CH ₂	PhCH ₂
D-1 / E- 338	PhCH ₂	PhCH ₂
D-1 / E- 339	PhCH ₂ CH ₂	PhCH ₂
D-1 / E- 340	(2-Cl-Ph)CH ₂	PhCH ₂
D-1 / E- 341	(3-Cl-Ph)CH ₂	PhCH ₂
D-1 / E- 342	(4-Cl-Ph)CH ₂	PhCH ₂
D-1 / E- 343	(2-CF ₃ -Ph)CH ₂	PhCH ₂
D-1 / E- 344	(3-CF ₃ -Ph)CH ₂	PhCH ₂
D-1 / E- 345	(4-CF ₃ -Ph)CH ₂	PhCH ₂
D-1 / E- 346	(2-CH ₃ O-Ph)CH ₂	PhCH ₂
D-1 / E- 347	(3-CH ₃ O-Ph)CH ₂	PhCH ₂
D-1 / E- 348	(4-CH ₃ O-Ph)CH ₂	PhCH ₂
D-1 / E- 349	CH ₃ O	PhCH ₂
D-1 / E- 350	CH ₃ CH ₂ O	PhCH ₂
D-1 / E- 351	n-C ₃ H ₇ O	PhCH ₂
D-1 / E- 352	iso-C ₃ H ₇ O	PhCH ₂

Compound	R ³	R ⁴
D-1 / E- 353	CH ₂ =CHCH ₂ O	PhCH ₂
D-1 / E- 354	CHCCH ₂ O	PhCH ₂
D-1 / E- 355	PhCH ₂ O	PhCH ₂
D-1 / E- 356	PhO	PhCH ₂
D-1 / E- 357	Ph	PhCH ₂
D-1 / E- 358	2-Cl-Ph	PhCH ₂
D-1 / E- 359	3-Cl-Ph	PhCH ₂
D-1 / E- 360	4-Cl-Ph	PhCH ₂
D-1 / E- 361	2-CF ₃ -Ph	PhCH ₂
D-1 / E- 362	3-CF ₃ -Ph	PhCH ₂
D-1 / E- 363	4-CF ₃ -Ph	PhCH ₂
D-1 / E- 364	2-CH ₃ O-Ph	PhCH ₂
D-1 / E- 365	3-CH ₃ O-Ph	PhCH ₂
D-1 / E- 366	4-CH ₃ O-Ph	PhCH ₂
D-1 / E- 367	4-CF ₃ O-Ph	PhCH ₂
D-1 / E- 368	4-CF ₃ CH ₂ O-Ph	PhCH ₂
D-1 / E- 369	4-(4-Cl-PhO)-Ph	PhCH ₂
D-1 / E- 370	4-(4-CF ₃ -PhO)-Ph	PhCH ₂
D-1 / E- 371	2,3-diCl-Ph	PhCH ₂
D-1 / E- 372	1-Pyrrolyl	PhCH ₂
D-1 / E- 373	1-Pyrazolyl	PhCH ₂
D-1 / E- 374	1,2,4-Triazol-1-yl	PhCH ₂
D-1 / E- 375	2-Thiazolyl	PhCH ₂
D-1 / E- 376	1,3,4-Thiadiazol-2-yl	PhCH ₂
D-1 / E- 377	CF ₃ CH ₂	PhCH ₂
D-1 / E- 378	ClCH ₂ CH ₂	PhCH ₂
D-1 / E- 379	ClCH ₂ CH ₂ CH ₂	PhCH ₂
D-1 / E- 380	CH ₃ OCH ₂ CH ₂	PhCH ₂
D-1 / E- 381	CH ₃ CH ₂ OCH ₂ CH ₂	PhCH ₂
D-1 / E- 382	CH ₃ OCH ₂ CH ₂ CH ₂	PhCH ₂
D-1 / E- 383	C ₂ H ₅ OCH ₂ CH ₂ CH ₂	PhCH ₂
D-1 / E- 384	n-C ₄ H ₉ OCH ₂ CH ₂ CH ₂	PhCH ₂
D-1 / E- 385	(CH ₃ O) ₂ CHCH ₂	PhCH ₂

Compound	R ³	R ⁴
D-1 / E- 386	CH(CH ₃)CH ₂ CH ₂ CH ₂ CH ₂	
D-1 / E- 387	CH ₂ CHBrCH ₂ CH ₂	
D-1 / E- 388	CH ₂ CH(OH)CH ₂ CH ₂	
D-1 / E- 389	CH ₂ CH=CHCH ₂	
D-1 / E- 390	Ph	Ph
D-1 / E- 391	CH ₃ SO ₂ OCH ₂ CH ₂ CH ₂ CH ₂	H
D-1 / E- 392	CH ₂ CH ₂ CH ₂ CH ₂ CH ₂	
D-1 / E- 393	CH ₂ CH ₂ OCH ₂ CH ₂	
D-1 / E- 394	CH ₂ CH ₂ SCH ₂ CH ₂	
D-1 / E- 395	CH ₂ CH ₂ NHCH ₂ CH ₂	
D-1 / E- 396	CH ₂ CH ₂ N(CH ₃)CH ₂ CH ₂	
D-1 / E- 397	N=CHCH ₂ CH ₂	

B. Formulation examples

- 5 a) A dust is obtained by mixing 10 parts by weight of active compound and 90 parts by weight of talc as inert material and comminuting the mixture in a hammer mill.
- 10 b) A wettable powder which is readily dispersible in water is obtained by mixing 25 parts by weight of active compound, 65 parts by weight of kaolin-containing quartz as inert material, 10 parts by weight of potassium lignosulfonate and 1 part by weight of sodium oleoylmethyltaurate as wetter and dispersant and grinding the mixture in a pinned-disk mill.
- 15 c) A dispersion concentrate which is readily dispersible in water is prepared by mixing 40 parts by weight of active compound with 7 parts by weight of a sulfo-succinic monoester, 2 parts by weight of a sodium lignosulfonate and 51 parts by

weight of water and grinding the mixture in a ball mill to a fineness of below 5 microns.

5 d) An emulsifiable concentrate can be prepared from 15 parts by weight of active compound, 75 parts by weight of cyclohexane as solvent and 10 parts by weight of oxyethylated nonylphenol (10 EO) as emulsifier.

10 e) Granules can be prepared from 2 to 15 parts by weight of active compound and an inert granule carrier material such as attapulgite, pumice granules and/or quartz sand. It is expedient to use a suspension of the wettable powder of example b) with a solids content of 30%, which is sprayed onto the surface of attapulgite granules, and these are dried and mixed intimately. The wettable powder amounts to approx. 5% by weight and the inert carrier material to approx. 95% by weight of the finished granules.

C. Biological examples

Example 1

- 5 Germinated field bean seeds (*Vicia faba*) with radicles are transferred into brown glass bottles filled with tap water and subsequently populated with approximately 100 black bean aphids (*Aphis fabae*). Plants and aphids are then dipped for 5 seconds into an aqueous solution of the formulated compound to be examined. After the solution has run off, plant and animals are stored in a climatized chamber
- 10 (16 hours of light/day, 25°C, 40-60% relative atmospheric humidity). After 3 and 6 days of storage, the effect of the compound on the aphids is determined. At a concentration of 300 ppm (based on the concentration of active compound), the compounds of the invention cause 90-100% mortality among the aphids.

15 Example 2

- Germinated field bean seeds (*Vicia faba*) with radicals are transferred into brown glass bottles filled with tap water. Four milliliters of an aqueous solution of the formulated compound to be examined are pipetted into the brown glass bottle. The
- 20 field bean is then heavily infested with about 100 black bean aphids (*Aphis fabae*). Plant and aphids are then stored in a climatized chamber (16 hours of light/day, 25°C, 40-60% relative atmospheric humidity). After 3 and 6 days of storage, the root-systemic effect of the compound on the aphids is determined. At a concentration of 300 ppm (based on the concentration of active compound), the
- 25 compounds of the invention cause 90-100% mortality among the aphids through root-systemic activity.